Vol. 1259 Number 4

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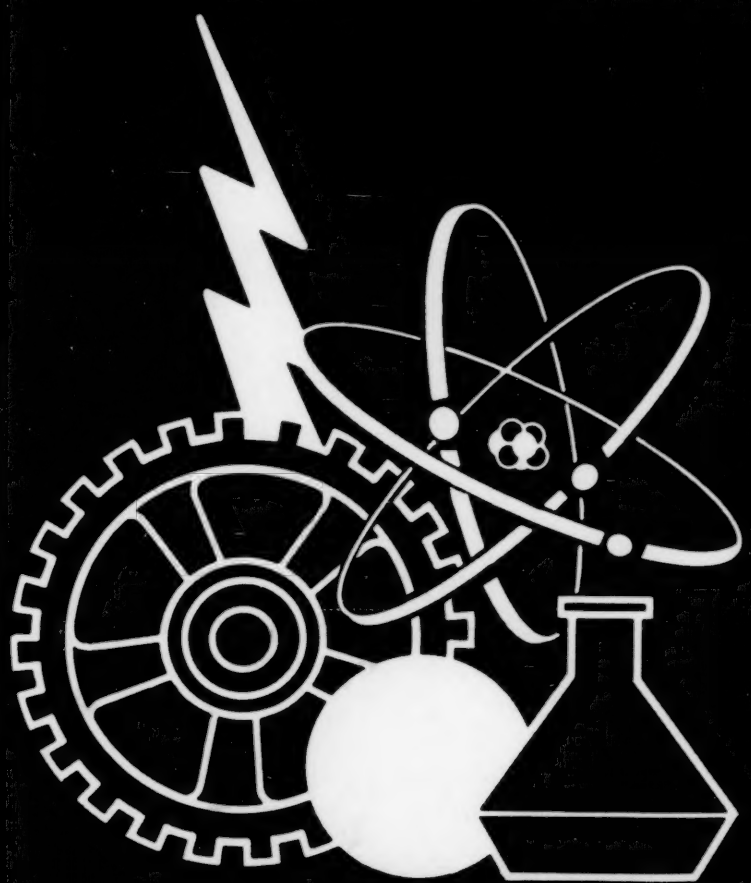

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

June 25, 2002 Volume 1259 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1251 O.G. 112, on October 23, 2001.

Either the United States Patent and Trademark Office or the European Patent Office may act as the International Searching Authority for an international application filed with the United States Receiving Office or the International Bureau as Receiving Office where at least one of the applicants is either a national or resident of the United States of America. However, the EPO is no longer a competent ISA, within the meaning of PCT Article 16(3), for international applications filed by US residents or nationals on or after 01 March 2002 in the USPTO or IB as receiving Office, and where the application contains one or more claims directed to the fields of biotechnology or business methods. For the definition of what the EPO considers to be precluded subject matter in the fileds of biotechnology and business methods, applicants should see the "Notice from the President of the European Patent Office," dated 26 November 2001, and which is published as Annex A in the "Notice Concerning EPO Competence to Act as PCT Authority" in the *Official Gazette* at 1255 O.G. 878, on February 19, 2002.

The European Patent Office may act as the International Preliminary Examining Authority (IPEA) for an international application filed in the United States Receiving Office or the International Bureau as Receiving Office where at least one of the applicants is either a national or resident of the United States of America, provided that the European Patent Office acted as the International Searching Authority. However, the EPO is no longer a competent IPEA, within the meaning of PCT Article 32(3), for international applications filed by US residents or nationals in the USPTO or IB as receiving Office where the corresponding demand is filed with the EPO on or after 01 March 2002, and where the application contains one or more claims directed to the fields of biotechnology, business methods or telecommunication. For the definition of what the EPO considers to be precluded subject matter in the field of telecommunication, applicants should see the "Notice from the President of the European Patent Office, " dated 26 November 2001, and which is published as Annex A in the "Notice Concerning EPO Competence to Act as PCT Authority" in the *Official Gazette* at 1255 O.G. 878, on February 19, 2002.

The search fee of the European Patent Office was increased, effective January 1, 2002, and was announced in the *Official Gazette* at 1253 O.G. 88, on December 25, 2001.

International fees were changed, effective on January 1, 2002, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1253 O.G. 88 on December 25, 2001. A change in the maximum number of designation fees payable, with effect from January 1, 2002, was announced in the *Official Gazette* at 1253 O.G. 88, on December 25, 2001. A change in the reduction for electronic filing, with effect from January 1, 2002, was announced in the *Official Gazette* at 1253 O.G. 88, on December 25, 2001.

Certain domestic PCT fees have been changed, effective October 1, 2001, to adjust certain patent fee amounts to relect fluctuations in the Consumer Price Index. The revisions were announced in the *Official Gazette* at 1249 O.G. 111, on August 28, 2001.

The schedule of PCT fees (in U.S. dollars), as of October 1, 2001, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	$240.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed under 35 U.S.C. 111(a)	$700.00
— Corresponding prior U.S. national application filed under 35 U.S.C. 111(a) and filing fee under 37 CFR 1.16(a) paid	$450.00
— Supplemental search fee, per additional invention (payable only upon invitation)	$210.00
European Patent Office as ISA	$866.00
International fees	
Basic fee	$407.00
Basic supplemental fee (for each page over 30)	$9.00
Designation fee per country or region	
— For the first 5 national or regional offices designated	$88.00
— For each designation in excess of 5 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	$88.00
— Confirmation fee	$44.00
(A reduction of $125 in the international fees is available in certain cases where PCT-EASY software is used to prepare the request, provided that the necessary conditions are met. See 1217 OG 131 (December 29, 1998)).	
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	$146.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	$490.00
— Additional examination fee, per additional invention (payable only upon invitation)	$140.00
— USPTO was not ISA in PCT Chapter I	$750.00
— Additional examination fee, per additional invention (payable only upon invitation)	$270.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	$50.00	$100.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	$355.00	$710.00
USPTO was ISA but not IPEA	$370.00	$740.00

USPTO was neither ISA nor IPEA — Search report has not been prepared by the European Patent Office or the Japanese Patent Office	$520.00	$1,040.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	$445.00	$890.00
Other National fees		
— For each independent claim in excess of 3	$42.00	$84.00
— For each claim in excess of 20	$9.00	$18.00
— For each application containing a multiple dependent claim	$140.00	$280.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	$65.00	$130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	$130.00	$130.00

May 15, 2002

JAMES E. ROGAN
Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office

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Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on June 15, 1999 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,911,174 through 5,913,262
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on June 13, 1995 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,423,087 through 5,425,141
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on June 11, 1991 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,022,092 through 5,023,951
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents may be submitted electronically over the Internet at www.uspto.gov.

Payments of maintenance fees in patents not submitted electronically over the Internet should be mailed to "United States Patent and Trademark Office, P.O. Box 371611, Pittsburgh, PA 15250-1611".

Correspondence related to maintenance fees other than payments of maintenance fees in patents is not to be mailed to P.O. Box 371611, Pittsburgh, PA 15250-1611, but must be mailed to "Box M Correspondence, "Commissioner of Patents and Trademarks, Washington, DC 20231".

Patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 2001, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.27(a)).....$440.00
By other than a small entity.....$880.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.27(a)).....$1,010.00
By other than a small entity.....$2,020.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on applications filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.27(a)).....$1,550.00
By other than a small entity.....$3,100.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.27(a)).....$65.00
By other than a small entity.....$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable.....$700.00
(2) unintentional.....$1,640.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED ON May 1, 2002
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,920,576	07/297,050	05/01/90
4,920,580	07/409,304	05/01/90
4,920,591	06/758,800	05/01/90
4,920,601	07/248,643	05/01/90
4,920,603	07/413,998	05/01/90
4,920,610	07/260,786	05/01/90
4,920,612	07/361,426	05/01/90
4,920,613	07/352,693	05/01/90
4,920,619	07/406,553	05/01/90
4,920,621	07/256,058	05/01/90
4,920,625	07/280,128	05/01/90
4,920,636	07/192,689	05/01/90
4,920,643	07/248,601	05/01/90
4,920,651	07/309,610	05/01/90
4,920,656	07/393,521	05/01/90
4,920,667	07/333,023	05/01/90
4,920,671	06/704,159	05/01/90
4,920,672	07/272,817	05/01/90
4,920,673	07/175,247	05/01/90
4,920,691	07/355,438	05/01/90
4,920,696	07/306,775	05/01/90
4,920,707	07/255,032	05/01/90
4,920,709	07/336,035	05/01/90
4,920,711	07/271,168	05/01/90
4,920,717	07/350,602	05/01/90
4,920,723	07/383,203	05/01/90
4,920,724	07/173,107	05/01/90
4,920,726	07/266,744	05/01/90
4,920,746	07/240,124	05/01/90
4,920,747	07/285,745	05/01/90
4,920,752	07/290,437	05/01/90
4,920,758	07/221,039	05/01/90
4,920,759	07/343,216	05/01/90
4,920,785	06/623,009	05/01/90
4,920,787	07/197,990	05/01/90
4,920,794	07/212,955	05/01/90
4,920,795	07/123,074	05/01/90
4,920,808	07/146,830	05/01/90
4,920,813	07/196,918	05/01/90
4,920,817	07/224,353	05/01/90
4,920,826	07/166,934	05/01/90
4,920,831	07/185,246	05/01/90
4,920,838	07/349,094	05/01/90
4,920,842	07/387,182	05/01/90
4,920,847	07/325,870	05/01/90
4,920,848	07/161,176	05/01/90
4,920,849	07/293,938	05/01/90
4,920,857	07/206,783	05/01/90
4,920,862	07/247,945	05/01/90
4,920,869	07/294,811	05/01/90
4,920,880	07/199,960	05/01/90
4,920,883	07/302,180	05/01/90
4,920,891	07/219,981	05/01/90
4,920,893	07/205,212	05/01/90
4,920,904	07/123,966	05/01/90
4,920,925	07/332,395	05/01/90
4,920,935	07/332,598	05/01/90
4,920,939	07/316,191	05/01/90
4,920,954	07/228,475	05/01/90
4,920,958	07/214,916	05/01/90
4,920,963	07/177,508	05/01/90
4,920,966	07/162,033	05/01/90
4,920,968	07/332,401	05/01/90
4,920,970	07/208,388	05/01/90
4,920,971	07/281,627	05/01/90
4,920,973	07/164,929	05/01/90
4,920,974	07/181,217	05/01/90
4,920,975	07/312,465	05/01/90
4,920,976	07/282,516	05/01/90
4,920,986	07/108,276	05/01/90
4,920,988	07/220,542	05/01/90
4,920,990	07/276,161	05/01/90
4,920,993	07/251,769	05/01/90
4,920,994	07/406,002	05/01/90
4,920,995	07/233,374	05/01/90
4,920,996	07/182,350	05/01/90
4,920,997	07/340,178	05/01/90
4,921,003	07/083,786	05/01/90
4,921,006	07/178,525	05/01/90
4,921,023	07/431,447	05/01/90
4,921,032	07/278,786	05/01/90
4,921,036	07/231,128	05/01/90
4,921,037	07/221,230	05/01/90
4,921,042	07/395,665	05/01/90
4,921,044	07/023,237	05/01/90
4,921,051	07/256,906	05/01/90
4,921,052	07/328,116	05/01/90
4,921,054	07/278,295	05/01/90
4,921,056	07/178,688	05/01/90
4,921,060	07/251,169	05/01/90
4,921,062	07/244,945	05/01/90
4,921,068	07/162,743	05/01/90
4,921,073	07/419,457	05/01/90
4,921,075	07/312,058	05/01/90
4,921,087	07/378,469	05/01/90
4,921,092	07/133,216	05/01/90
4,921,096	07/297,126	05/01/90
4,921,097	07/388,585	05/01/90
4,921,098	07/364,816	05/01/90
4,921,102	07/294,201	05/01/90
4,921,109	07/158,116	05/01/90
4,921,114	07/273,044	05/01/90
4,921,119	07/353,782	05/01/90
4,921,135	07/318,596	05/01/90
4,921,136	07/277,229	05/01/90
4,921,163	07/094,139	05/01/90
4,921,172	07/152,552	05/01/90
4,921,176	07/191,024	05/01/90
4,921,187	07/272,430	05/01/90
4,921,197	07/263,291	05/01/90
4,921,201	07/227,299	05/01/90
4,921,205	07/195,027	05/01/90
4,921,209	07/354,348	05/01/90
4,921,211	07/315,921	05/01/90
4,921,217	07/107,798	05/01/90
4,921,229	07/404,846	05/01/90
4,921,230	07/322,576	05/01/90
4,921,233	07/350,363	05/01/90
4,921,247	06/895,142	05/01/90
4,921,273	07/292,429	05/01/90
4,921,284	07/344,736	05/01/90
4,921,285	07/198,982	05/01/90
4,921,289	07/143,521	05/01/90
4,921,291	07/222,072	05/01/90
4,921,305	07/256,201	05/01/90
4,921,311	07/182,704	05/01/90
4,921,313	07/113,257	05/01/90
4,921,315	07/259,330	05/01/90
4,921,327	07/356,115	05/01/90
4,921,333	07/296,555	05/01/90
4,921,336	06/811,261	05/01/90
4,921,338	07/349,234	05/01/90
4,921,341	07/183,078	05/01/90
4,921,363	07/330,930	05/01/90
4,921,366	07/306,249	05/01/90
4,921,370	07/211,986	05/01/90
4,921,375	07/203,161	05/01/90
4,921,393	07/166,095	05/01/90

Patent Number	Serial Number	Issue Date
4,921,394	07/223,171	05/01/90
4,921,395	06/918,346	05/01/90
4,921,396	07/158,041	05/01/90
4,921,404	06/882,936	05/01/90
4,921,406	07/293,775	05/01/90
4,921,410	07/225,215	05/01/90
4,921,412	07/255,591	05/01/90
4,921,413	07/310,961	05/01/90
4,921,415	07/272,358	05/01/90
4,921,422	07/347,261	05/01/90
4,921,426	07/183,986	05/01/90
4,921,437	07/331,418	05/01/90
4,921,444	07/256,734	05/01/90
4,921,449	07/331,748	05/01/90
4,921,456	07/225,990	05/01/90
4,921,470	07/063,957	05/01/90
4,921,471	07/394,809	05/01/90
4,921,480	07/274,327	05/01/90
4,921,482	07/295,124	05/01/90
4,921,489	07/221,869	05/01/90
4,921,520	07/149,400	05/01/90
4,921,528	07/260,212	05/01/90
4,921,533	07/361,232	05/01/90
4,921,539	07/256,526	05/01/90
4,921,560	07/105,336	05/01/90
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4,921,607	07/160,029	05/01/90
4,921,609	07/371,338	05/01/90
4,921,610	07/236,711	05/01/90
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4,921,658	07/125,741	05/01/90
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4,921,671	07/219,925	05/01/90
4,921,674	07/240,996	05/01/90
4,921,675	07/043,610	05/01/90
4,921,682	07/205,890	05/01/90
4,921,686	07/204,957	05/01/90
4,921,698	07/105,473	05/01/90
4,921,699	07/257,900	05/01/90
4,921,707	07/165,102	05/01/90
4,921,715	07/292,832	05/01/90
4,921,730	07/186,087	05/01/90
4,921,734	07/192,711	05/01/90
4,921,739	07/434,446	05/01/90
4,921,741	07/209,580	05/01/90
4,921,750	07/198,475	05/01/90
4,921,751	07/041,779	05/01/90
4,921,758	07/140,997	05/01/90
4,921,764	07/306,115	05/01/90
4,921,773	07/292,032	05/01/90
4,921,778	07/226,282	05/01/90
4,921,782	07/200,541	05/01/90
4,921,783	07/371,831	05/01/90
4,921,788	07/180,543	05/01/90
4,921,793	06/927,716	05/01/90
4,921,799	07/093,497	05/01/90
4,921,814	07/289,210	05/01/90
4,921,815	07/203,931	05/01/90
4,921,817	07/353,652	05/01/90
4,921,818	07/169,203	05/01/90
4,921,824	07/213,802	05/01/90
4,921,825	07/245,399	05/01/90
4,921,828	07/212,048	05/01/90
4,921,843	07/260,447	05/01/90
4,921,845	07/281,582	05/01/90
4,921,849	07/220,596	05/01/90
4,921,855	07/204,549	05/01/90
4,921,865	07/203,733	05/01/90
4,921,866	07/185,873	05/01/90
4,921,868	07/234,632	05/01/90
4,921,876	07/288,396	05/01/90
4,921,878	07/214,285	05/01/90
4,921,883	07/169,967	05/01/90
4,921,886	07/270,528	05/01/90
4,921,903	07/256,339	05/01/90
4,921,904	07/286,106	05/01/90
4,921,909	06/946,057	05/01/90
4,921,910	07/340,284	05/01/90
4,921,916	07/222,400	05/01/90
4,921,926	07/271,985	05/01/90
4,921,931	07/324,866	05/01/90
4,921,941	07/068,509	05/01/90
4,921,948	07/319,064	05/01/90
4,921,955	07/136,167	05/01/90
4,921,959	07/344,204	05/01/90
4,921,977	07/293,448	05/01/90
4,922,016	07/385,583	05/01/90
4,922,022	07/195,722	05/01/90
4,922,033	07/094,171	05/01/90
4,922,034	07/094,172	05/01/90
4,922,035	07/094,352	05/01/90
4,922,036	07/094,175	05/01/90
4,922,039	07/290,023	05/01/90
4,922,048	07/257,894	05/01/90
4,922,049	07/297,640	05/01/90
4,922,050	07/353,584	05/01/90
4,922,051	07/325,735	05/01/90
4,922,073	07/393,940	05/01/90
4,922,079	07/407,673	05/01/90
4,922,082	07/325,160	05/01/90
4,922,083	07/185,155	05/01/90
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4,922,123	07/324,414	05/01/90
4,922,128	07/296,995	05/01/90
4,922,134	07/309,386	05/01/90
4,922,145	07/272,370	05/01/90
4,922,146	07/327,447	05/01/90
4,922,150	07/336,083	05/01/90
4,922,161	07/332,340	05/01/90
4,922,164	07/251,774	05/01/90
4,922,176	07/245,332	05/01/90
4,922,178	07/091,799	05/01/90
4,922,181	07/227,274	05/01/90
4,922,184	07/237,438	05/01/90
4,922,205	07/363,157	05/01/90
4,922,209	07/345,135	05/01/90
4,922,213	07/255,637	05/01/90
4,922,222	07/213,765	05/01/90
4,922,240	07/139,872	05/01/90
4,922,254	07/180,209	05/01/90
4,922,259	07/152,245	05/01/90
4,922,263	07/344,412	05/01/90
4,922,276	07/383,972	05/01/90
4,922,278	07/199,208	05/01/90
4,922,284	07/347,071	05/01/90
4,922,305	07/407,182	05/01/90
4,922,313	07/130,679	05/01/90
4,922,315	07/120,036	05/01/90
4,922,319	07/374,589	05/01/90
4,922,345	07/148,611	05/01/90
4,922,347	06/271,911	05/01/90
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4,922,360	07/249,306	05/01/90
4,922,363	07/182,904	05/01/90

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4,922,365	07/337,420	05/01/90
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4,922,370	07/320,279	05/01/90
4,922,384	07/363,129	05/01/90
4,922,400	07/388,852	05/01/90
4,922,410	07/086,279	05/01/90
4,922,413	07/029,665	05/01/90
4,922,423	07/130,938	05/01/90
4,922,426	07/187,198	05/01/90
4,922,427	07/125,952	05/01/90
4,922,428	07/130,473	05/01/90
4,922,447	06/917,345	05/01/90
4,922,460	07/364,516	05/01/90
4,922,466	07/250,736	05/01/90
4,922,471	07/319,602	05/01/90
4,922,473	07/333,295	05/01/90
4,922,477	07/200,052	05/01/90
4,922,483	07/250,721	05/01/90
4,922,497	07/309,919	05/01/90
4,922,510	07/156,683	05/01/90
4,922,516	07/360,469	05/01/90
4,922,527	07/306,945	05/01/90
4,922,534	07/303,896	05/01/90
4,922,537	07/057,370	05/01/90
4,922,544	07/094,773	05/01/90
4,922,545	07/310,026	05/01/90
4,922,547	07/132,480	05/01/90

PATENTS WHICH EXPIRED ON April 26, 2002
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
5,305,478	08/019,399	04/26/94
5,305,479	08/064,952	04/26/94
5,305,480	08/040,374	04/26/94
5,305,483	08/027,815	04/26/94
5,305,490	08/047,298	04/26/94
5,305,493	07/858,772	04/26/94
5,305,494	08/027,671	04/26/94
5,305,500	08/004,793	04/26/94
5,305,503	08/109,057	04/26/94
5,305,509	07/909,718	04/26/94
5,305,523	07/996,445	04/26/94
5,305,525	07/821,831	04/26/94
5,305,530	08/101,039	04/26/94
5,305,535	07/688,520	04/26/94
5,305,540	07/993,352	04/26/94
5,305,541	07/973,643	04/26/94
5,305,543	08/019,076	04/26/94
5,305,544	08/048,894	04/26/94
5,305,557	07/944,594	04/26/94
5,305,560	08/061,700	04/26/94
5,305,562	07/935,978	04/26/94
5,305,567	07/855,440	04/26/94
5,305,576	07/879,882	04/26/94
5,305,580	07/947,997	04/26/94
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5,305,582	08/020,174	04/26/94
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5,305,705	07/837,349	04/26/94
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5,305,726	07/954,450	04/26/94
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5,305,765	07/967,936	04/26/94
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5,305,780	08/033,046	04/26/94
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5,305,801	07/918,428	04/26/94
5,305,803	08/047,555	04/26/94
5,305,807	08/051,613	04/26/94
5,305,809	07/963,596	04/26/94
5,305,810	07/887,032	04/26/94
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5,305,812	08/027,255	04/26/94
5,305,817	07/740,823	04/26/94
5,305,820	07/910,274	04/26/94
5,305,821	07/724,971	04/26/94
5,305,822	08/070,211	04/26/94
5,305,823	07/670,939	04/26/94
5,305,828	08/052,899	04/26/94
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5,305,833	08/017,788	04/26/94
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5,305,842	07/989,598	04/26/94
5,305,847	08/071,903	04/26/94
5,305,848	07/922,922	04/26/94
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5,305,979	07/849,279	04/26/94
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5,305,985	08/056,167	04/26/94
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5,305,998	07/501,483	04/26/94
5,306,002	08/059,097	04/26/94
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5,306,027	08/008,576	04/26/94
5,306,029	07/709,208	04/26/94
5,306,036	08/087,998	04/26/94
5,306,037	08/038,495	04/26/94
5,306,041	07/983,569	04/26/94
5,306,051	07/849,510	04/26/94
5,306,053	08/086,295	04/26/94
5,306,054	08/047,698	04/26/94
5,306,062	08/050,842	04/26/94
5,306,064	08/059,125	04/26/94
5,306,065	08/033,266	04/26/94
5,306,071	07/893,837	04/26/94
5,306,076	07/886,123	04/26/94
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5,306,090	08/114,362	04/26/94
5,306,091	08/093,399	04/26/94
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5,306,096	07/935,428	04/26/94
5,306,107	08/022,808	04/26/94
5,306,109	07/938,158	04/26/94
5,306,110	07/888,014	04/26/94
5,306,113	07/974,901	04/26/94
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5,306,132	07/661,560	04/26/94
5,306,133	08/007,322	04/26/94
5,306,135	07/834,527	04/26/94
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5,306,139	07/792,708	04/26/94
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5,306,157	07/898,812	04/26/94
5,306,161	07/994,862	04/26/94
5,306,163	07/936,956	04/26/94
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5,306,612	07/259,349	04/26/94
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5,306,687	08/046,796	04/26/94
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5,306,766	07/939,481	04/26/94
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5,306,783	07/985,312	04/26/94
5,306,784	07/831,763	04/26/94
5,306,788	07/837,030	04/26/94
5,306,797	08/000,586	04/26/94
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5,306,817	07/962,768	04/26/94
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5,306,833	08/012,632	04/26/94
5,306,836	08/034,802	04/26/94
5,306,837	08/091,389	04/26/94
5,306,841	07/955,708	04/26/94
5,306,844	07/522,065	04/26/94
5,306,850	08/040,992	04/26/94
5,306,856	07/897,388	04/26/94
5,306,859	08/077,142	04/26/94
5,306,861	07/925,249	04/26/94
5,306,866	07/867,953	04/26/94
5,306,868	07/979,207	04/26/94
5,306,872	07/996,368	04/26/94
5,306,879	07/828,103	04/26/94
5,306,882	07/708,946	04/26/94
5,306,891	07/862,479	04/26/94
5,306,893	07/922,425	04/26/94
5,306,897	07/902,659	04/26/94
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5,306,955	07/688,849	04/26/94
5,306,957	07/911,415	04/26/94
5,306,968	07/955,403	04/26/94
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5,306,973	07/857,503	04/26/94
5,306,974	07/997,462	04/26/94
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5,306,986	07/887,168	04/26/94
5,306,998	07/934,259	04/26/94
5,307,020	07/853,814	04/26/94
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5,307,032	07/952,530	04/26/94
5,307,038	07/500,630	04/26/94
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5,307,509	07/791,161	04/26/94
5,307,510	07/995,552	04/26/94
5,307,513	07/766,072	04/26/94
5,307,517	07/778,501	04/26/94

PATENTS WHICH EXPIRED ON April 28, 2002
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
5,742,936	08/787,285	04/28/98
5,742,941	08/588,633	04/28/98
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5,742,951	08/756,624	04/28/98
5,742,952	08/768,770	04/28/98
5,742,955	08/714,592	04/28/98
5,742,958	08/820,113	04/28/98

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5,742,977	08/797,777	04/28/98
5,742,981	08/674,202	04/28/98
5,742,983	08/559,062	04/28/98
5,742,985	08/772,594	04/28/98
5,742,988	08/670,586	04/28/98
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5,742,992	08/606,604	04/28/98
5,742,994	08/653,049	04/28/98
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5,742,997	08/802,525	04/28/98
5,742,998	08/807,163	04/28/98
5,743,014	08/799,600	04/28/98
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5,743,018	08/813,057	04/28/98
5,743,022	08/745,250	04/28/98
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5,743,041	08/725,392	04/28/98
5,743,043	08/504,428	04/28/98
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5,743,578	08/774,405	04/28/98
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5,744,211	08/178,626	04/28/98
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5,744,234	08/547,115	04/28/98
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5,744,249	08/588,860	04/28/98
5,744,252	08/075,367	04/28/98
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5,744,692	08/244,646	04/28/98
5,744,694	08/819,831	04/28/98
5,744,703	08/805,517	04/28/98
5,744,706	08/565,913	04/28/98
5,744,717	08/677,674	04/28/98
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5,744,736	08/711,234	04/28/98
5,744,763	08/551,034	04/28/98
5,744,768	08/713,376	04/28/98
5,744,770	08/598,215	04/28/98
5,744,778	08/626,500	04/28/98
5,744,783	08/755,312	04/28/98
5,744,823	08/728,119	04/28/98
5,744,833	08/706,704	04/28/98
5,744,835	08/747,928	04/28/98
5,744,850	08/733,967	04/28/98
5,744,855	08/460,940	04/28/98
5,744,860	08/595,920	04/28/98
5,744,861	08/558,021	04/28/98
5,744,869	08/567,518	04/28/98
5,744,899	08/417,336	04/28/98
5,744,913	08/237,850	04/28/98
5,744,926	08/743,285	04/28/98
5,744,933	08/746,568	04/28/98
5,744,934	08/873,237	04/28/98
5,744,938	08/680,771	04/28/98
5,744,947	08/744,380	04/28/98
5,744,954	08/755,785	04/28/98
5,744,970	08/813,108	04/28/98
5,745,006	08/747,497	04/28/98
5,745,025	08/592,683	04/28/98
5,745,038	08/822,213	04/28/98
5,745,040	08/740,023	04/28/98
5,745,062	08/513,302	04/28/98
5,745,074	08/652,006	04/28/98
5,745,077	08/665,309	04/28/98
5,745,080	08/871,642	04/28/98
5,745,083	08/846,169	04/28/98
5,745,093	08/067,831	04/28/98
5,745,102	08/819,445	04/28/98
5,745,104	08/868,538	04/28/98
5,745,117	08/607,839	04/28/98
5,745,127	08/707,599	04/28/98
5,745,138	08/643,701	04/28/98
5,745,162	08/582,471	04/28/98
5,745,173	08/340,053	04/28/98
5,745,190	08/839,096	04/28/98
5,745,216	08/557,500	04/28/98
5,745,304	08/757,710	04/28/98
5,745,309	08/823,706	04/28/98
5,745,315	08/742,484	04/28/98
5,745,321	08/594,132	04/28/98
5,745,326	08/734,079	04/28/98
5,745,328	08/811,111	04/28/98
5,745,331	08/381,786	04/28/98
5,745,345	08/650,858	04/28/98
5,745,367	08/655,020	04/28/98
5,745,369	08/453,765	04/28/98
5,745,376	08/647,097	04/28/98
5,745,385	08/233,022	04/28/98
5,745,387	08/536,011	04/28/98
5,745,392	08/539,415	04/28/98
5,745,399	08/638,171	04/28/98
5,745,403	08/810,608	04/28/98
5,745,409	08/535,441	04/28/98
5,745,431	08/583,263	04/28/98
5,745,440	08/665,307	04/28/98
5,745,480	08/681,191	04/28/98
5,745,501	08/824,381	04/28/98
5,745,508	08/556,335	04/28/98
5,745,535	08/553,063	04/28/98
5,745,537	08/833,621	04/28/98
5,745,540	08/513,138	04/28/98
5,745,549	08/769,604	04/28/98
5,745,551	08/144,127	04/28/98
5,745,552	08/562,226	04/28/98
5,745,554	08/683,483	04/28/98
5,745,576	08/650,888	04/28/98
5,745,584	08/631,705	04/28/98
5,745,585	08/240,700	04/28/98
5,745,587	08/475,230	04/28/98
5,745,631	08/592,691	04/28/98
5,745,638	08/673,781	04/28/98
5,745,667	08/600,440	04/28/98
5,745,670	08/661,368	04/28/98
5,745,680	08/691,359	04/28/98
5,745,706	08/367,505	04/28/93
5,745,718	08/509,676	04/28/98
5,745,719	08/375,119	04/28/98
5,745,720	08/445,765	04/28/98
5,745,735	08/549,405	04/28/98
5,745,751	08/631,122	04/28/98
5,745,786	08/188,555	04/28/98
5,745,835	08/711,951	04/28/98
5,745,845	08/454,676	04/28/98
5,745,861	08/613,924	04/28/98
5,745,884	08/733,942	04/28/98
5,745,908	08/625,743	04/28/98

Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 5/20/2002

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,886,150	07/197,678	05/23/88	12/12/89	05/22/02
5,108,323	07/585,426	09/20/90	04/28/92	05/21/02
5,133,554	07/770,169	10/02/91	07/28/92	05/20/02
5,154,429	07/840,393	02/24/92	10/13/92	05/20/02
5,171,002	07/817,284	01/06/92	12/15/92	05/23/02
5,246,455	07/702,585	05/17/91	09/21/93	05/24/02
5,257,789	07/945,165	09/15/92	11/02/93	05/24/02

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
5,259,692	07/940,982	09/04/92	11/09/93	05/24/02
5,273,373	07/847,175	05/05/92	12/28/93	05/21/02
5,286,653	06/881,825	07/03/86	02/15/94	05/23/02
5,292,065	07/906,800	06/30/92	03/08/94	05/24/02
5,293,912	07/913,730	07/16/92	03/15/94	05/20/02
5,507,816	08/256,025	09/06/94	04/16/96	05/21/02
5,543,450	08/534,167	09/26/95	08/06/96	05/24/02
5,578,073	08/307,335	09/16/94	11/26/96	05/24/02
5,617,071	08/384,647	02/06/95	04/01/97	05/24/02
5,633,407	08/444,325	05/18/95	05/27/97	05/21/02
5,648,598	08/359,874	12/20/94	07/15/97	05/23/02
5,655,354	08/411,419	03/27/95	08/12/97	05/23/02
5,682,415	08/543,170	10/13/95	10/28/97	05/24/02
5,690,028	08/659,632	06/06/96	11/25/97	05/22/02
5,696,285	08/586,022	12/29/95	12/09/97	05/22/02
5,697,618	08/443,684	05/18/95	12/16/97	05/20/02
5,703,579	08/638,230	04/26/96	12/30/97	05/22/02
5,718,184	08/754,786	11/21/96	02/17/98	05/24/02
5,722,260	08/762,930	12/10/96	03/03/98	05/22/02
5,727,786	08/569,793	12/08/95	03/17/98	05/21/02
5,742,375	08/653,507	05/24/96	04/21/98	05/24/02

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

4,902,431, Re. S.N. 10/117,082, Apr. 08, 2002, Cl. 210/751, METHOD FOR TREATING WASTEWATER SLUDGE, John P. Nicholson, et al., Owner of Record: *N-Viro International Corporation, Toledo, OH,* Attorney or Agent: Kristina M. Castellano, Ex. Gp.: 1724

5,094,041, Re. S.N. 09/862,905, May 22, 2001, Cl. 052/057, RIDGE CAP TYPE ROOF VENTILATOR, Gary P. Kasner, et al., Owner of Record: *Liberty Diversified Industries, Inc., New Hope, MN,* Attorney or Agent: William Larry Alexander, Ex. Gp.: 3635

5,602,952, Re. S.N. 10/140,000, May 07, 2002, Cl. 385/100, PACKAGING FIBRE OPTIC COMPONENTS, Scott C. Rashleigh, et al., Owner of Record: *ADC Australia Pty., Ltd., Fyshwick, Australia,* Attorney or Agent: David G. Schmaltz, Ex. Gp: 2874

5,623,477, Re. S.N. 10/138,737, May 03, 2002, Cl. 369/275, OPTICAL RECORDING DISK CAPABLE OF RESYNCHRONIZATION IN DIGITAL ENCODING AND DECODING, Inventor Toshiyuki Shimada, et al., Owner of Record: *Matsushita Electric Industrial Company, Ltd., Osaka, Japan,* Attorney or Agent: Michael A. Makuch, Ex. Gp.: 2651

5,623,477, Re. S.N. 10/138,738, May 03, 2002, Cl. 369/275, OPTICAL RECORDING DISK CAPABLE OF RESYNCHRONIZATION IN DIGITAL ENCODING AND DECODING, Toshiyuki Shimada, et al., Owner of Record: *Matsushita Electric Industrial Company, Ltd., Osaka, Japan,* Attorney or Agent: Michael A. Makuch, Ex. Gp.: 2651

5,737,710, Re. S.N. 10/132,222, Apr. 26, 2002, Cl. 701/001, AUTOMATED VEHICLE PARKING SYSTEM FOR A PLURALITY OF REMOTE PARKING FACILITIES, Robert B. Anthonyson, Owner of Record: *TC (Bermuda) License, Ltd., Hamilton, Bermuda,* Attorney or Agent: Michael C. Greenbaum, Ex. Gp.: 3614

5,764,622, Re. S.N. 10/014,431, Dec. 14, 2001, Cl. 369/291, RECORDING MEDIUM CARTIDGE AND SIGNAL RECORDING APPARATUS, Ichiro Kawamura, et al., Owner of Record: *Matsushita Electric Industrial Co. LTD., Osaka, Japan,* Attorney or Agent: Michael E. Fogarty, Ex. Gp.: 2754

5,764,622, Re. S.N. 10/028,799, Dec. 28, 2001, Cl. 369/291, RECORDING MEDIUM CARTRIDGE AND SIGNAL RECORDING APPARATUS, Ichiro Kawamura, et al., Owner of Record: *Matsushita Electric Industrial Co. LTD., Osaka, Japan,* Attorney or Agent: Michael E. Fogarty, Ex. Gp.: 2754

5,813,193, Re. S.N. 09/962,614, Sep. 26, 2001, Cl. 123/000, TWO-CYCLE ENGINE WITH ELECTRONIC FUEL INJECTION, Ronald E. Chasteen, Owner of Record: *Injection Research Specialist, Inc., Colorado Springs, Colorado,* Attorney or Agent: Cameron K. Weiffenbach, Ex. Gp.: 3747

5,930,179, Re. S.N. 09/915,906, Jul. 25, 2001, Cl. 365/189, PROGRAM CIRCUIT, Byoung Kwon Cha, Owner of Record: *Hyundai Electronics Industries Co., LTD., Kyungki-do, KP,* Attorney or Agent: Steve Y. Cho, Ex. Gp.: 2818

5,986,798, Re. S.N. 09/992,859, Nov. 14, 2001, Cl. 359/326, METHOD AND ARRANGEMENT FOR POLING OF OPTICAL CRYSTALS, Hakan Karlsson, et al., Owner of Record: *Cobolt AB, Saltsjo-boo, Sweden* Attorney or Agent: Joseph H. Golant, Ex. Gp.: 2874

5,988,827, Re. S.N. 10/008,079, Nov. 08, 2001, Cl. 362/031, DISPLAY DEVICES HAVING ROUNDED CORNER BACKLIGHT UNIT, Ik-Soo Lee, Owner of Record: *Samsung Electronics Co., LTD., Kyungki-do,* Republic of Korea, Attorney or Agent: David D. Beatty, Ex. Gp.: 3743

5,990,086, Re. S.N. 09/991,603, Nov. 23, 2001, Cl. 514/012, THERAPEUTIC USE OF BPI PROTEIN PRODUCTS FOR HUMAN MENINGOCCEMIA, Brett P. Giroir, et al., Owner of Record: *Xoma Corporation, Berkeley, California; Board Of Regents, The University of Texas, Austin, TX,* Attorney or Agent: Jeffrey Sharp, Ex. Gp.: 1654

5,999,827, Re. S.N. 10/007,104, Dec. 03, 2001, Cl. 455/564, COMMUNICATION TERMINAL APPARATUS AND CONTROL METHOD THEREOF, Fukuharu Sudo, et al., Owner of Record: *Sony Corporation, Tokyo, Japan,* Attorney or Agent: Jay H. Maioli, Ex. Gp.: 2682

6,002,813, Re. S.N. 10/012,527, Dec. 12, 2001, Cl. 382/300, INTERPOLATION METHOD FOR BINARY IMAGE, Dae-sung Cho, et al., Owner of Record: *Samsung Electronics Company, Inc., Suwon-city, Korea,* Attorney or Agent: Charles F. Wieland, III, Ex. Gp.: 2621

6,040,472, Re. S.N. 10/101,252, Mar. 20, 2002, Cl. 560/210, CATALYST FOR USE IN PRODUCING CARBOXYLIC ESTERS, Setsuo Yamamatsu, et al., Owner of Record: *Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan,* Attorney or Agent: Raymond C. Stewart, Ex. Gp.: 1621

6,049,911, Re. S.N. 10/125,785, Apr. 18, 2002, Cl. 002/195, SIZED HEAD GEAR, Craig Bromberg, Owner of Record: *Midway Industries LTD, Monteal, Canada,* Attorney or Agent: Douglas R. Wolf, Ex. Gp.: 3741

6,051,008, Re. S.N. 09/213,008, Apr. 18, 2002, Cl. 606/159, APPARATUS HAVING STABILIZATION MEMBERS FOR PERCUTANEOUSLY PERFORMING SURGERY AND METHODS OF USE, Vahid Saadat, Owner of Record: *Angiotrax, Inc, Sunnyvale, California,* Attorney or Agent: James C. Scheller, Ex. Gp.: 3731

6,053,624, Re. S.N. 10/127,614, Apr. 22, 2002, Cl. 362/347, LAMP REFLECTOR WITH ADJUSTABLE CURVATURE, Paul Andrew Cronk, Harbord, Australia, Owner of Record: *Inventor,* Attorney or Agent: John F. McKenna, Ex. Gp.: 2875

6,055,909, Re. S.N. 10/137,107, May 02, 2002, Cl. 102/336, ELECTRONICALLY CONFIGURABLE TOWED DECOY FOR DISPENSING INFRARED EMITTING FLARES, AND METHOD FOR DISPENSING FLARE MATERIAL, L. Ray Sweeney, et al., Owner of Record: *Raytheon Company, Lexington, MA,* Attorney or Agent: Gregory Garmong, Ex. Gp: 3641

6,056,407, Re. S.N. 10/136,333, May 02, 2002, Cl. 353/119, PROJECTION DISPLAY DEVICE, Kazuyuki Iinuma, et al., Owner of Record: *Seiko Epson Corporation, Tokyo, Japan,* Attorney or Agent: James A. Oliff, Ex. Gp: 2851

6,056,904, Re. S.N. 10/123,858, Apr. 17, 2002, Cl. 264/077, CULTURED STONE METHODS OF MANUFACTURE, Kenneth Wiener, Owner of Record: *American Stone Pioneers, Rancho Parlos Verdes, California,* Attorney or Agent: Ex. Gp.: 1732

6,058,056, Re. S.N. 10/139,131, May 02, 2002, Cl. 365/201, DATA COMPRESSION CIRCUIT AND METHOD FOR TESTING MEMORY DEVICES, Ray Beffa, et al., Owner of Record: *Micron Technology, Inc., Boise, ID,* Attorney or Agent: Paul F. Rusyn, Ex. Gp: 2818

6,058,938, Re. S.N. 10/140,370, May 08, 2002, Cl. 128/898, INTRAMUSCULAR STIMULATION THERAPY USING LOCALIZED ELECTRICAL STIMULATION, Jennifer Chu, et al., Owner of Record: *Medelec Limited, Oxon, United Kingdom,* Attorney or Agent: Christopher L. McKee, Ex. Gp: 3738

6,064,443, Re. S.N. 10/131,049, Apr. 25, 2002, Cl. 348/530, METHOD FOR DETECTING AND SEPARATING VERTICAL AND HORIZONTAL SYNCHRONOUS SIGNALS FROM COMPUTER SYSTEM, Ji-Young Lee, Owner of Record: *Samsung Electronics Company, Ltd., Suwon-city, Japan,* Attorney or Agent: Robert E. Bushnell, Ex. Gp.: 2714

6,096,140, Re. S.N. 10/137,593, May 02, 2002, Cl. 148/240, TREATING SOLUTION AND TREATING METHOD FOR FORMING PROTECTIVE COATING FILMS ON METALS, Hideo Susa, et al., Owner of Record: *Nihon Hyomen Kagaku Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: James P. Zeller, Ex. Gp.: 1742

6,257,109, Re. S.N. 10/139,222, May 07, 2002, Cl. 082/001.100, AUTOMATIC LATHE AND METHOD OF CONTROLLING SAME, Hiroshi Shinohara, et al., Owner of Record: *Citizen Watch Co., Ltd., Tokyo, Japan,* Attorney or Agent: Thomas E. Brown, Ex. Gp: 3722

6,274,852, Re. S.N. 10/128,106, Apr 23, 2002, Cl. 219/505, CONDUCTIVE POLYMER COMPOSITIONS CONTAINING N-N- M-PHENYLENEDIMALEIMIDE AND DEVICES, Edward J. Block, et al., Owner of Record: *Thermo-O- Disc, Inc., Mansfield, OH,* Attorney or Agent: Robert M. Siminski, Ex. Gp: 3742

6,338,412, Re. S.N. 10/140,205, May 08, 2002, Cl. 210/415, CYLINDRICAL SCREEN, PARTICULARY FOR PAPER PULP, Alain Serres, et al., Owner of Record: *Kadant Lamort, Vitry Le Francois, France,* Attorney or Agent: Frank P. Presta, Ex. Gp: 1724

Requests for Ex Parte Reexamination Filed

5,616,774, Reexam. C.N. 90/006,280, Requested Date: May 07, 2002, Cl. 560/004, Title: INHIBITION OF UNSATURATED MONOMERS WITH 7-ARYL QUINONE METHIDES, Inventor: Samuel Evans, et. al., Owner of Record: *Ondeo Nalco Energy Services, L. P., Sugar Land, TX,* Attorney or Agent: Thomas M. Breininger, Patent and Licensing Department, Nalco Chemical Company, Naperville, IL, Ex. Gp.: 1625, Requester: Hoffmann & Baron, Syosset, NY

6,097,859, Reexam. C.N. 90/006,278, Requested Date: May 06, 2002, Cl. 385/017, Title: MULTI-WAVELENGTH CROSS-CONNECT OPTICAL SWITCH, Inventor: Olav Solgaard, et. al., Owner of Record: *The Regents of the Univ. of California, Oakland, CA,* Attorney or Agent: John P. O'Banion, O'Banion & Ritchey, Sacramento, CA, Ex. Gp.: 2874, Requester: Geoffrey R. Myers, Hall, Priddy, Myers & Vande Sande, Potomac, MD

6,208,301, Reexam. C.N. 90/006,282, Requested Date: May 08, 2002, Cl. 343/702, Title: ANTENNA DEVICE, Inventor: Anders Sandgren, et. al., Owner of Record: *Allgon AB, Akersberga, Sweden,* Attorney or Agent: John C. Holman, Jacobson Holman, Washington, DC, Ex. Gp.: 2821, Requester: Owners

6,250,387, Reexam. C.N. 90/006,281, Requested Date: May 06, 2002, Cl. 166/311, Title: APPARATUS FOR CATCHING DEBRIS IN A WELL-BORE, Inventor: Mark Carmichael, et. al., Owner of Record: *SPS-AFOS Group Limited, Aberdeen, United Kingdom,* Attorney or Agent: C. Dean Domingue, Lafayette, LA, Ex. Gp.: 3672, Requester: Owners

6,283,044, Reexam. C.N. 90/006,283, Requested Date: May 09, 2002, Cl. 108/57.25, Title: PALLET ASSEMBLY, Inventor: William P. Apps, Owner of Record: *Rehig Pacific Company, Los Angeles, CA,* Attorney or Agent: Brooks & Kushman, Southfield, MI, Ex. Gp.: 3637, Requester: Nucon Corporation, c/o Richard C. Himelhoch, Wallenstein & Wagner, Ltd., Chicago, IL

6,327,398, Reexam. C.N. 90/006,279, Requested Date: May 07, 2002, Cl. 385/018, Title: MULTI-WAVELENGTH CROSS-CONNECT OPTICAL SWITCH, Inventor: Olav Solgaard, et. al., Owner of Record: *The Regents of the Univ. of California, Oakland, CA,* Attorney or Agent: John P. O'Banion, O'Banion & Ritchey, Sacramento, CA, Ex. Gp.: 2874, Requester: Geoffrey R. Myers, Hall, Priddy, Myers & Vande Sande, Potomac, MD

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within one year before the expiration of the period for which the registration was issued or renewed, or it may be done within six months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED
June 2, 2002
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
143,011	71/135,419	05/24/1921
142,972	71/136,006	05/24/1921
142,973	71/136,698	05/24/1921
143,143	71/138,454	05/24/1921
387,501	71/436,759	05/20/1941
387,521	71/438,634	05/20/1941
387,522	71/438,782	05/20/1941
542,514	71/509,082	05/22/1951
542,558	71/558,713	05/22/1951
542,591	71/566,481	05/22/1951
542,634	71/577,509	05/22/1951
542,653	71/582,343	05/22/1951
542,720	71/592,032	05/22/1951
542,767	71/595,857	05/22/1951
542,770	71/595,887	05/22/1951
542,771	71/595,907	05/22/1951
542,773	71/596,052	05/22/1951
542,790	71/596,664	05/22/1951
715,784	72/056,563	05/23/1961
715,918	72/067,042	05/23/1961
715,895	72/067,318	05/23/1961
715,616	72/079,822	05/23/1961
715,916	72/079,996	05/23/1961
715,899	72/086,330	05/23/1961
715,618	72/089,181	05/23/1961
715,866	72/089,332	05/23/1961
715,695	72/089,338	05/23/1961
715,780	72/089,339	05/23/1961
715,787	72/089,864	05/23/1961
715,869	72/091,912	05/23/1961
715,903	72/092,501	05/23/1961
715,727	72/093,031	05/23/1961
715,596	72/093,493	05/23/1961
715,619	72/093,977	05/23/1961
715,612	72/094,273	05/23/1961
715,656	72/097,443	05/23/1961
715,857	72/097,527	05/23/1961
715,912	72/099,175	05/23/1961
715,871	72/099,704	05/23/1961
715,797	72/099,922	05/23/1961
715,873	72/100,320	05/23/1961
715,896	72/100,374	05/23/1961
715,819	72/100,436	05/23/1961
715,801	72/100,950	05/23/1961
715,848	72/100,956	05/23/1961
715,601	72/101,005	05/23/1961
715,622	72/101,823	05/23/1961
715,878	72/102,194	05/23/1961
715,879	72/102,232	05/23/1961
715,732	72/102,469	05/23/1961
715,733	72/102,510	05/23/1961
715,734	72/103,065	05/23/1961
715,826	72/103,094	05/23/1961
715,827	72/103,139	05/23/1961
715,603	72/103,399	05/23/1961
715,832	72/103,468	05/23/1961
715,835	72/103,567	05/23/1961
715,755	72/103,796	05/23/1961
715,604	72/104,155	05/23/1961
715,904	72/104,229	05/23/1961
715,882	72/104,394	05/23/1961
715,794	72/104,445	05/23/1961
715,674	72/104,889	05/23/1961
715,760	72/105,116	05/23/1961
715,639	72/105,126	05/23/1961
715,640	72/105,202	05/23/1961
715,739	72/105,853	05/23/1961
715,692	72/105,989	05/23/1961
715,769	72/106,037	05/23/1961
715,851	72/106,323	05/23/1961
715,852	72/106,385	05/23/1961
715,841	72/106,491	05/23/1961
715,842	72/106,842	05/23/1961
715,843	72/106,843	05/23/1961
911,714	72/285,589	05/25/1971
911,798	72/330,879	05/25/1971
911,726	72/350,030	05/25/1971
911,746	72/362,293	05/25/1971
911,748	72/369,042	05/25/1971
1,155,234	73/053,321	05/26/1981
1,155,310	73/080,142	05/26/1981
1,155,738	73/088,681	05/26/1981
1,155,311	73/104,540	05/26/1981
1,155,843	73/109,898	05/26/1981
1,155,882	73/113,592	05/26/1981
1,155,883	73/113,593	05/26/1981
1,155,345	73/128,179	05/26/1981
1,155,935	73/128,461	05/26/1981
1,155,465	73/128,558	05/26/1981
1,155,466	73/130,022	05/26/1981
1,155,592	73/139,259	05/26/1981
1,155,264	73/142,619	05/26/1981
1,155,346	73/144,917	05/26/1981
1,155,450	73/146,934	05/26/1981
1,155,347	73/147,089	05/26/1981
1,155,593	73/148,926	05/26/1981
1,155,348	73/150,074	05/26/1981
1,155,349	73/151,028	05/26/1981
1,155,451	73/151,682	05/26/1981
1,155,799	73/152,556	05/26/1981
1,155,981	73/153,676	05/26/1981
1,155,351	73/154,841	05/26/1981
1,155,353	73/159,335	05/26/1981
1,155,603	73/161,387	05/26/1981
1,155,845	73/162,208	05/26/1981
1,155,659	73/163,715	05/26/1981
1,155,469	73/167,004	05/26/1981
1,155,358	73/168,710	05/26/1981
1,155,527	73/169,164	05/26/1981
1,155,660	73/170,843	05/26/1981
1,155,359	73/172,513	05/26/1981
1,155,743	73/174,952	05/26/1981
1,155,315	73/175,578	05/26/1981
1,155,662	73/177,661	05/26/1981
1,155,364	73/181,641	05/26/1981
1,155,266	73/182,842	05/26/1981
1,155,641	73/183,912	05/26/1981
1,155,365	73/185,876	05/26/1981
1,155,744	73/185,943	05/26/1981
1,155,945	73/186,192	05/26/1981
1,155,664	73/187,035	05/26/1981
1,155,316	73/187,761	05/26/1981
1,155,666	73/188,079	05/26/1981
1,155,896	73/188,330	05/26/1981
1,155,455	73/188,886	05/26/1981
1,155,473	73/190,068	05/26/1981
1,155,946	73/190,480	05/26/1981
1,155,972	73/190,697	05/26/1981
1,155,847	73/191,030	05/26/1981
1,155,642	73/191,173	05/26/1981
1,155,629	73/191,200	05/26/1981
1,155,947	73/191,340	05/26/1981
1,155,370	73/191,458	05/26/1981
1,155,948	73/191,484	05/26/1981
1,155,643	73/191,916	05/26/1981
1,155,821	73/192,648	05/26/1981
1,155,498	73/193,176	05/26/1981

Reg. Number	Serial Number	Reg. Date
1,155,474	73/193,600	05/26/1981
1,155,607	73/194,520	05/26/1981
1,155,672	73/194,749	05/26/1981
1,155,319	73/195,970	05/26/1981
1,155,499	73/196,586	05/26/1981
1,155,608	73/196,679	05/26/1981
1,155,824	73/196,911	05/26/1981
1,155,678	73/198,458	05/26/1981
1,155,679	73/198,463	05/26/1981
1,155,680	73/199,022	05/26/1981
1,155,681	73/199,023	05/26/1981
1,155,200	73/199,106	05/26/1981
1,155,950	73/199,520	05/26/1981
1,155,202	73/199,681	05/26/1981
1,155,983	73/199,768	05/26/1981
1,155,951	73/199,972	05/26/1981
1,155,826	73/200,991	05/26/1981
1,155,955	73/201,228	05/26/1981
1,155,684	73/201,865	05/26/1981
1,155,387	73/202,313	05/26/1981
1,155,686	73/202,347	05/26/1981
1,155,647	73/203,424	05/26/1981
1,155,648	73/203,425	05/26/1981
1,155,274	73/203,808	05/26/1981
1,155,853	73/203,998	05/26/1981
1,155,956	73/204,231	05/26/1981
1,155,959	73/204,596	05/26/1981
1,155,691	73/204,996	05/26/1981
1,155,277	73/205,208	05/26/1981
1,155,960	73/205,268	05/26/1981
1,155,887	73/205,949	05/26/1981
1,155,278	73/206,818	05/26/1981
1,155,961	73/206,927	05/26/1981
1,155,963	73/207,198	05/26/1981
1,155,964	73/207,199	05/26/1981
1,155,392	73/207,524	05/26/1981
1,155,323	73/207,595	05/26/1981
1,155,395	73/208,314	05/26/1981
1,155,856	73/209,261	05/26/1981
1,155,397	73/209,395	05/26/1981
1,155,633	73/210,145	05/26/1981
1,155,696	73/210,240	05/26/1981
1,155,537	73/210,389	05/26/1981
1,155,966	73/211,072	05/26/1981
1,155,857	73/211,117	05/26/1981
1,155,402	73/211,535	05/26/1981
1,155,698	73/211,752	05/26/1981
1,155,699	73/211,754	05/26/1981
1,155,403	73/211,798	05/26/1981
1,155,915	73/212,469	05/26/1981
1,155,829	73/212,900	05/26/1981
1,155,859	73/212,925	05/26/1981
1,155,860	73/213,027	05/26/1981
1,155,575	73/213,891	05/26/1981
1,155,245	73/214,225	05/26/1981
1,155,246	73/214,282	05/26/1981
1,155,916	73/214,817	05/26/1981
1,155,790	73/214,896	05/26/1981
1,155,831	73/214,934	05/26/1981
1,155,325	73/215,585	05/26/1981
1,155,897	73/215,616	05/26/1981
1,156,009	73/215,772	05/26/1981
1,155,340	73/217,012	05/26/1981
1,155,702	73/217,342	05/26/1981
1,155,704	73/217,978	05/26/1981
1,155,975	73/218,075	05/26/1981
1,155,286	73/218,246	05/26/1981
1,155,544	73/218,626	05/26/1981
1,155,706	73/218,695	05/26/1981
1,155,224	73/220,074	05/26/1981
1,155,775	73/220,230	05/26/1981
1,155,708	73/221,085	05/26/1981
1,155,862	73/221,787	05/26/1981
1,155,484	73/222,223	05/26/1981
1,155,612	73/222,801	05/26/1981
1,155,577	73/222,814	05/26/1981
1,155,598	73/223,403	05/26/1981
1,155,776	73/223,603	05/26/1981
1,155,891	73/224,168	05/26/1981
1,155,290	73/224,293	05/26/1981
1,155,757	73/224,386	05/26/1981
1,155,414	73/224,611	05/26/1981
1,155,578	73/224,935	05/26/1981
1,155,804	73/225,720	05/26/1981
1,155,758	73/226,149	05/26/1981
1,155,415	73/226,337	05/26/1981
1,155,547	73/226,447	05/26/1981
1,155,291	73/226,586	05/26/1981
1,155,416	73/226,947	05/26/1981
1,155,292	73/227,041	05/26/1981
1,155,807	73/228,335	05/26/1981
1,155,654	73/228,387	05/26/1981
1,155,923	73/228,465	05/26/1981
1,155,589	73/228,722	05/26/1981
1,155,816	73/228,748	05/26/1981
1,155,998	73/229,140	05/26/1981
1,155,999	73/229,141	05/26/1981
1,155,778	73/229,323	05/26/1981
1,155,549	73/229,587	05/26/1981
1,155,250	73/229,600	05/26/1981
1,155,294	73/230,019	05/26/1981
1,155,817	73/230,401	05/26/1981
1,155,552	73/230,698	05/26/1981
1,155,728	73/231,008	05/26/1981
1,155,419	73/231,013	05/26/1981
1,155,719	73/231,063	05/26/1981
1,155,767	73/231,136	05/26/1981
1,155,555	73/231,483	05/26/1981
1,155,900	73/231,678	05/26/1981
1,155,422	73/232,101	05/26/1981
1,155,926	73/232,417	05/26/1981
1,155,423	73/232,581	05/26/1981
1,155,424	73/232,661	05/26/1981
1,155,426	73/233,085	05/26/1981
1,155,226	73/233,277	05/26/1981
1,155,721	73/233,326	05/26/1981
1,155,252	73/233,392	05/26/1981
1,155,253	73/233,508	05/26/1981
1,155,254	73/233,509	05/26/1981
1,155,560	73/233,539	05/26/1981
1,155,563	73/233,637	05/26/1981
1,155,564	73/233,646	05/26/1981
1,155,723	73/233,691	05/26/1981
1,155,566	73/234,565	05/26/1981
1,155,928	73/234,616	05/26/1981
1,155,428	73/235,317	05/26/1981
1,155,929	73/235,396	05/26/1981
1,155,892	73/235,433	05/26/1981
1,155,508	73/235,669	05/26/1981
1,155,840	73/236,111	05/26/1981
1,155,619	73/236,136	05/26/1981
1,155,639	73/236,214	05/26/1981
1,155,877	73/236,225	05/26/1981
1,155,211	73/236,306	05/26/1981
1,155,429	73/236,660	05/26/1981
1,155,735	73/236,918	05/26/1981
1,155,813	73/237,190	05/26/1981
1,155,902	73/237,420	05/26/1981
1,155,903	73/237,421	05/26/1981
1,155,602	73/237,772	05/26/1981
1,155,503	73/238,799	05/26/1981
1,155,504	73/239,415	05/26/1981
1,155,433	73/240,862	05/26/1981
1,155,780	73/240,898	05/26/1981

Reg. Number	Serial Number	Reg. Date
1,155,435	73/241,191	05/26/1981
1,155,304	73/242,106	05/26/1981
1,155,782	73/242,340	05/26/1981
1,155,793	73/242,970	05/26/1981
1,155,442	73/242,984	05/26/1981
1,155,443	73/242,991	05/26/1981
1,155,445	73/244,198	05/26/1981
1,155,306	73/244,275	05/26/1981
1,155,795	73/244,544	05/26/1981
1,155,796	73/244,545	05/26/1981
1,155,797	73/244,546	05/26/1981
1,155,307	73/245,956	05/26/1981
1,155,893	73/246,464	05/26/1981
1,155,625	73/249,167	05/26/1981
1,155,449	73/250,110	05/26/1981
1,155,462	73/250,384	05/26/1981
1,155,463	73/250,455	05/26/1981
1,155,464	73/250,457	05/26/1981
1,155,784	73/257,748	05/26/1981
1,645,447	73/660,746	05/21/1991
1,645,309	73/705,187	05/21/1991
1,644,990	73/715,196	05/21/1991
1,645,566	73/754,589	05/21/1991
1,645,549	73/763,874	05/21/1991
1,645,475	73/767,975	05/21/1991
1,644,979	73/796,397	05/21/1991
1,645,174	73/799,879	05/21/1991
1,645,268	73/800,208	05/21/1991
1,645,081	73/802,992	05/21/1991
1,645,175	73/807,987	05/21/1991
1,644,952	73/808,680	05/21/1991
1,645,250	73/810,504	05/21/1991
1,645,298	73/816,149	05/21/1991
1,645,003	73/826,301	05/21/1991
1,645,005	73/827,575	05/21/1991
1,645,704	73/830,116	05/21/1991
1,645,007	73/831,672	05/21/1991
1,644,912	73/832,030	05/21/1991
1,645,316	73/836,235	05/21/1991
1,645,182	74/005,320	05/21/1991
1,645,672	74/007,203	05/21/1991
1,645,686	74/009,143	05/21/1991
1,645,015	74/011,896	05/21/1991
1,645,017	74/014,057	05/21/1991
1,645,574	74/015,097	05/21/1991
1,645,084	74/016,394	05/21/1991
1,645,020	74/016,587	05/21/1991
1,645,539	74/017,825	05/21/1991
1,645,270	74/018,390	05/21/1991
1,644,867	74/020,183	05/21/1991
1,645,290	74/021,602	05/21/1991
1,645,556	74/023,058	05/21/1991
1,645,665	74/023,210	05/21/1991
1,645,101	74/027,506	05/21/1991
1,645,616	74/028,354	05/21/1991
1,645,102	74/028,462	05/21/1991
1,645,272	74/030,283	05/21/1991
1,645,619	74/034,904	05/21/1991
1,645,197	74/035,749	05/21/1991
1,645,367	74/039,611	05/21/1991
1,645,103	74/040,070	05/21/1991
1,644,922	74/040,845	05/21/1991
1,644,982	74/042,368	05/21/1991
1,645,489	74/046,608	05/21/1991
1,645,305	74/047,112	05/21/1991
1,645,626	74/049,223	05/21/1991
1,645,438	74/050,184	05/21/1991
1,645,252	74/054,598	05/21/1991
1,645,628	74/055,645	05/21/1991
1,645,042	74/057,724	05/21/1991
1,645,275	74/058,100	05/21/1991
1,645,260	74/058,558	05/21/1991
1,644,966	74/058,569	05/21/1991
1,645,464	74/058,579	05/21/1991
1,645,377	74/058,852	05/21/1991
1,645,544	74/060,491	05/21/1991
1,645,705	74/060,775	05/21/1991
1,645,631	74/061,444	05/21/1991
1,644,942	74/061,653	05/21/1991
1,644,943	74/061,656	05/21/1991
1,645,527	74/062,162	05/21/1991
1,644,870	74/062,576	05/21/1991
1,645,428	74/063,170	05/21/1991
1,645,276	74/064,681	05/21/1991
1,645,150	74/064,876	05/21/1991
1,645,151	74/064,880	05/21/1991
1,645,152	74/064,885	05/21/1991
1,645,429	74/065,321	05/21/1991
1,644,895	74/065,502	05/21/1991
1,645,557	74/065,538	05/21/1991
1,645,558	74/065,864	05/21/1991
1,645,642	74/065,980	05/21/1991
1,645,299	74/066,163	05/21/1991
1,645,468	74/066,389	05/21/1991
1,645,213	74/067,562	05/21/1991
1,645,054	74/067,740	05/21/1991
1,645,588	74/068,054	05/21/1991
1,645,215	74/068,160	05/21/1991
1,645,063	74/070,316	05/21/1991
1,645,294	74/070,600	05/21/1991
1,645,332	74/071,113	05/21/1991
1,645,501	74/071,688	05/21/1991
1,645,132	74/071,950	05/21/1991
1,644,899	74/072,350	05/21/1991
1,645,300	74/072,793	05/21/1991
1,645,295	74/073,030	05/21/1991
1,645,652	74/073,140	05/21/1991
1,645,069	74/073,482	05/21/1991
1,645,136	74/073,854	05/21/1991
1,645,307	74/074,034	05/21/1991
1,645,654	74/074,881	05/21/1991
1,645,507	74/074,942	05/21/1991
1,645,074	74/075,657	05/21/1991
1,645,594	74/075,667	05/21/1991
1,645,253	74/076,441	05/21/1991
1,644,945	74/077,007	05/21/1991
1,645,510	74/077,778	05/21/1991
1,645,235	74/077,809	05/21/1991
1,645,264	74/077,914	05/21/1991
1,645,398	74/077,977	05/21/1991
1,646,058	74/078,044	05/28/1991
1,645,354	74/078,423	05/21/1991
1,645,114	74/078,540	05/21/1991
1,644,934	74/078,672	05/21/1991
1,645,681	74/080,057	05/21/1991
1,645,355	74/080,386	05/21/1991
1,645,565	74/080,876	05/21/1991
1,645,342	74/081,034	05/21/1991
1,645,343	74/081,209	05/21/1991
1,645,346	74/081,267	05/21/1991
1,645,247	74/081,325	05/21/1991
1,645,239	74/081,538	05/21/1991
1,645,349	74/082,673	05/21/1991
1,645,535	74/092,147	05/21/1991

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

The Original Caribean Cookie Company, St. Thomas, U.S. Virgin Islands, Reg. No. 2,020,301 for the mark "TROPICAL TREASURE", Can. No. 32,532.

SHIRLEY HASSAN
Paralegal Specialist
Trademark Trial and Appeal Board, for
ROBERT M. ANDERSON
Acting Assistant Commissioner For Trademarks

On behalf of JAMES E. ROGAN
Under Secretary of Commerce For Intellectual Property and
Director of the United States Patent and Trademark Office

May 31, 2002

JAMES A. TOUPIN
General Counsel
United States Patent and Trademark Office

Service by Publication

Notice of Complaint

A complaint against Steven Dale Gilliam initiating a disciplinary proceeding under 37 C.F.R. § 10.134 has been lodged with an Administrative Law Judge.

The complaint has been twice mailed in accordance with 37 C.F.R. § 10.135(a)(2)(i) and (b) by first-class mail to Mr. Gilliam at the address for which separate notice was last received by the Director of Enrollment and Discipline. The United States Postal Service has been unable to deliver the complaint. Mr. Gilliam is hereby notified that he may obtain a copy of the complaint upon written request addressed to the Director of Enrollment and Discipline, OED, P.O. Box 16116, Arlington, VA 22215. Mr. Gilliam is further notified that unless such request is made and an answer is filed on or before August 8, 2002 it will be presumed that he does not desire to answer the complaint, and a decision by default may be entered against him.

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37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of a national stage application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventors whose signatures are missing (Albert P. LI and Achilles DEMETRIOU) may join in the application by promptly filing an appropriate oath or declaration complying with 37 CFR 1.63. The international application number is PCT/US94/10935 and was filed on 27 September 1994 in the names of Edward F. MYERS, Albert P. LI and Achilles DEMETRIOU for the invention entitled ARTIFICIAL LIVER APPARATUS AND METHOD. The national stage application number is 08/809,677 and has a 35 U.S.C. 371 date of 20 February 2002.

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37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of the inventor. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Alan Bradley Jones) may join in the application by promptly filing an appropriate oath or declaration complying with 37 CFR 1.63. The international application number is PCT/AU00/00158 and was filed on 06 March 2000 in the names of Alan Bradley Jones and David Ross Taylor for the invention entitled APPARATUS AND SYSTEM FOR CLASSIFYING AND CONTROL ACCESS TO INFORMATION. The national stage application number is 09/914,733 and has a 35 U.S.C. 371 date of 17 December 2001.

Notice of Exclusion on Consent

Val Jean F. Hillman, of Schaumburg, Illinois, Registration No. 34,841, has been excluded on consent by the Director of the United States Patent and Trademark Office pursuant to 35 U.S.C. § 32. This action is taken pursuant to 35 U.S.C. § 32, and 37 C.F.R. §§ 10.133(e), and 10.159(b).

Errata

"All reference to Patent No. 6,393,787 to Edward Nolan of Kildare, Ireland for MODULAR WALL ELEMENT appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,393,891 to Kenneth A. Wollermann of Mukwonago, WI for METHOD OF CALIBRATING A CRIMPING PRESS appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,394,147 to Eddy Verclyte of Ieper, Belgium, for THREAD GRIPPER FOR A RAPIER OF A RAPIER LOOM appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,394,177 to Claude Gerard, et al of Chantraine, France for CORRUGATED FIN WITH PARTIAL OFFSET FOR A PLATE-TYPE HEAT EXCHANGER AND CORRESPONDING PLATE-TYPE HEAT EXCHANGER appearing in the Official Gazette of May 28, should be deleted since no patent was granted."

"All reference to Patent No. 6,394,342 to Thomas Katis of New York, NY for METHOD AND SYSTEM FOR CO-BRANDING AN ELECTRONIC PAYMENT PLATFORM SUCH AS AN ELECTRONIC WALLET appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,394,350 to Mathew N. Rekow, et al of California, for DIODE-LASER LIGHT PROJECTOR FOR ILLUMINATING A LINEAR ARRAY OF LIGHT MODULATORS appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,394,934 to Thomas Andrew McKernan of Churchill, Australia for EXERCISE DEVICE appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,394,957 to John W. Allison, et al of Los Altos, CA for MEDICAL DIAGNOSTIC ULTRASOUND IMAGING SYSTEM AND METHOD FOR DETERMINING AN ACOUSTIC OUTPUT PARAMETER OF A TRANSMITTED ULTRASOUND BEAM appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All referenced to Patent No. 6,395,009 to Lutz T. Kynast, et al of Suwanee, GA for MICRODRIVE FOR PROBES appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,395,418 to Robert G. Moore, et al of Reisterstown, MD for BATTERY COOLING SYSTEM appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,395,460 to Zbysalaw R. Owczarczyk, et al of Webster, NY for IMAGING ELEMENT CONTAINING A BLOCKED PHOTOGRAPHICALLY USEFUL COMPOUND appearing in the official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,395,570 to Yue Liu of Minnesota for INTEGRATION OF TOP-EMITING AND TOP-ILLUMINATED OPTOELECTRONIC DEVICES WITH MICRO-OPTIC

AND ELECTRONIC INTEGRATED CIRCUITS appearing in the Offcial Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,395,682 to Frank Runge, et al of Maxdorf, Germany for SOLID PHYTOSANITARY AGENT appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,395,929 to Kazuyoshi Ichihara, et al of Japan, for PROCESS FOR PRODUCING FLUOROALKYLCARBOXYLIC ACID appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,396,489 to Masaki Watanabe, et al of Japan, for METHOD AND APPARATUS FOR SYNTHESIZING IMAGES appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,397,045 to Jukka Sirola, et al of Tampere, Finland for WIRELESS COMMUNICATION DEVICE AND A METHOD OF MANUFACTURING A WIRELESS COMMUNICATION DEVICE appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,397,052 to Sam Morrar of Randolph, NJ for METHOD AND APPARATUS FOR IMPROVING EFFICIENCY OF HIGH-POWER LINEAR AMPLIFIER appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,397,101 to Harry Herbert Peel, et al of San Antonio, TX for DYNAMIC CARDIOVASCULAR MONITOR appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

"All reference to Patent No. 6,397,257 to Jeffrey Morris of El Cerrito, CA for DATA TRANSFER PROTOCOL FLOW CONTROLLER AND METHOD appearing in the Official Gazette of May 28, 2002 should be deleted since no patent was granted."

Erratum

In the notice of Certificate of Correction appearing in May 14, 2002 O.G., Vol. 1258 O.G. 61, delete all reference to Patent No. 6,262,934, issue of April 23, 2002, the number was erroneously mentioned and should be deleted since no certificate of correction was issued.

Erratum

In the notice of Certificate of Correction appearing in April 16, 2002 O.G., Vol. 1257 O.G. 102, delete all reference to Patent No. 6,231,313, issue of March 26, 2002, the number was erroneously mentioned and should be deleted since no certificate of correction was issued.

Certificates of Correction for June 4, 2002

D. 429,824	D. 454,933	5,116,725	5,725,921
D. 447,685	D. 455,426	5,122,448	5,743,055
D. 448,006	PP. 11,979	5,126,258	5,757,915
D. 449,278	PP. 12,098	5,176,998	5,759,341
D. 450,138	RE. 37,371	5,192,987	5,771,489
D. 450,301	RE. 37,384	5,244,813	5,796,512
D. 450,658	RE. 37,437	5,296,395	5,798,248
D. 452,699	RE. 37,524	5,319,371	5,808,978
D. 452,957	RE. 37,665	5,336,597	5,827,997
D. 453,286	4,783,399	5,584,455	5,843,306
D. 454,137	4,818,678	5,702,637	5,849,572
D. 454,921	5,030,717	5,723,980	5,856,326
5,882,362	6,162,654	6,236,516	6,268,348
5,886,706	6,162,696	6,236,632	6,268,748
5,889,217	6,163,225	6,236,774	6,268,924
5,901,061	6,163,368	6,237,077	6,269,181
5,933,841	6,164,712	6,239,334	6,270,182
5,936,896	6,165,389	6,239,610	6,270,406
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5,946,438	6,166,564	6,240,509	6,270,572
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5,956,512	6,168,645	6,244,493	6,270,840
5,964,332	6,170,042	6,244,955	6,270,938
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5,985,662	6,177,130	6,245,515	6,271,229
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6,001,079	6,181,608	6,248,226	6,272,071
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6,012,095	6,184,220	6,249,966	6,274,174
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6,043,816	6,195,501	6,254,212	6,277,664
6,044,487	6,199,550	6,255,301	6,278,603
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6,060,331	6,200,683	6,255,789	6,279,598
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6,064,854	6,205,772	6,256,731	6,280,431
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6,074,425	6,207,559	6,257,171	6,280,751
6,075,385	6,208,811	6,257,922	6,280,882
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6,101,176	6,218,268	6,261,641	6,282,416
6,101,965	6,221,019	6,261,787	6,282,447
6,103,131	6,221,332	6,262,004	6,282,527
6,112,308	6,221,378	6,262,485	6,283,164
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Summary of Final Decisions Issued by the Trademark Trial and Appeal Board

May 13-17, 2002

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
5-14	EX	75/873,722	Afendi, Inc.	2(d)	Refusal Affirmed		"AFENDI" (in stylized lettering and incorporating a double "A" design) [boxes made of precious metal, ankle and wrist bracelets, brooches, cases made of precious metal, chains, findings, identification bracelets, jewelry, jewelry pins made of precious metal for use on hats, lapel pins, and rings being jewelry]	"FENDI" (in stylized lettering and incorporating a double "F" design) [watches not made wholly or in part of precious metals, costume jewelry, namely earrings, cufflinks, and ornamental pins, bracelets and necklaces]; "FENDI" (in stylized lettering) [watches and parts therefor]	No
5-14	EX	75/531,517	Inktec Co., Ltd.	2(d)	Refusal Reversed		"INKTEC" (in stylized design format) [ink cartridges for computer printers; computer peripherals and computer printers]	"INKOTECH" [printing inks; ultraviolet acrylic coating for use on compact disks, printing paper and as insulation on fiber optic cable]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
5-14	EX EX	75/178,161 75/178,162	Comark, Inc.	genericness; whether, if not generic, applicant's mark has acquired distinctiveness under Section 2(f)	Refusal Affirmed as to lack of 2(f) distinctiveness, but PC WHOLESALE found not generic		"PC WHOLESALE" and "PC WHOLESALE" (in design format) [both marks for catalogs featuring personal computers and computer peripherals;telephone, mail and fax order services featuring computer hardware, software, and computer peripherals; computer hardware and peripherals installation]		No
5-14	EX	75/819,592	Masco Corp. of Indiana	2(d) (with consent from owner of cited registration)	Refusal Reversed		"SIGNATURE" [plumbing products, namely, faucets]	"SIGNATURE" [shower heads]	No
5-14	EX	75/523,702	Thomson Consumer Electronics, Inc.	2(d)	Refusal Affirmed		"HORIZONS" [flat-screen televisions]	"HORIZON" [satellite antennas]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
5-14	EX	75/719,666	Mental Images GmbH & Co. KG	2(e)(1)	Refusal Reversed		"INCREMENTAL IMAGES" [computer software for use by software developers in creating applications that provide for interactive visualization manipulation and modification of three-dimensional digital content over worldwide global computer networks, together with printed instructional anuals and printed instructional and teaching guides sold therewith as a unit]		No
5-14	EX (R)	75/858,278	Leonard P. Gietz, M.D.	whether applicant's composite mark is inherently distinctive	Request for Reconsideration Denied (Refusal Affirmed)		*mark comprising:* the disclaimed term "RENT-A-PHONE," displayed in light green letters (in an italicized sans serif font) within an elliptical field providing a white background with a light green border		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
5-14	EX	75/707,361	Advanced Cardiovascular Systems, Inc.	2(d)	Refusal Affirmed		"VERSASAIL" [dilation catheters]	"VERSASEAL" [trocar seal components]	No
5-14	EX	75/709,532	Tower Tech, Inc.	2(e)(1)	Refusal Affirmed		"SMART-TOWER" [commercial and industrial cooling towers and accessories therefor, sold as a unit]		Yes
5-14	EX	75/568,851	The Holland Company Inc. of the Carolinas	whether the matter applicant seeks to register has acquired distinctiveness as a trademark	Refusal Affirmed		the configuration of applicant's goods, "featuring an octagonal housing with dual chimneys thereon" [outdoor cooking grills]		No
5-15	EX	76/082,254	American Library Association	2(d)	Refusal Affirmed		"ALA EDITIONS" (and design) [series of fiction and non-fiction books on a variety of topics]	"ALA" [educational services, namely, providing instruction by classes, residential school programs and the like, to others for development of English language skills and cultural background, and the training of teachers and development of multimedia materials for such instruction]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
5-15	OPP	120,088	RA Brands, L.L.C. v. Pure Fishing, Inc.	2(d)	Opposition Dismissed	design mark incorporating a graphic representation of a fish and fishing line [fishing tackle, fishing line, fishing hooks, fishing leaders and flying discs, along with clothing and cloth patches for clothing]	"BERKLEY CATCH MORE FISH" (and fish design) [*a variety of goods related to fishing, including:* fishing line strippers; fishing hand tools, namely, pliers, fishing knives, scissors, hook files, crimpers, line cutters, and manually-operated line spooling machines; shirts, caps, hats, jackets, coats and windshirts; fishing rods; fishing reels; fishing line; artificial fishing lures; artificial fishing baits; fish attractants; fishing tackle, namely, fishing hooks, leaders used for fishing, etc.]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

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a request for redacted publication (37 CFR 1.217(b));
a request for voluntary publication of an application filed before November 29, 2000 (37 CFR 1.221(a)); or
a request for republication of an application that has already been published (37 CFR 1.221(a)).

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Box Designations	Explanation
Box REISSUE	All new and continuing Reissue application filings.
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Box 313(b)	Petitions under 37 CFR 1.313(c) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for a continuing application or a request for continued examination (RCE).
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box Conversion	Requests under 37 CFR 1.53(c)(2) to convert a nonprovisional application to a provisional application and requests under 37 CFR 1.53(c)(3) to convert a provisional application to a nonprovisional application.
Box CPA	Requests for Continued Prosecution Applications (CPA's) under 37 CFR 1.53(d).
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box Design	The filing of all design patent applications which do not request expedited examination under 37 CFR 1.155.
Box Expedited Design	Only to be used for the initial filing of design applications accompanied by a request for expedited examination under 37 CFR 1.155. (Design applicants seeking expedited examination may alternatively file a design application and corresponding request under 37 CFR 1.155 by hand-delivering the application papers and request directly to the Design Group Director's office.)
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection.)
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PGPUB	Correspondence regarding publication of patent applications not otherwise provided.
Box PGPUB - ABD	Petitions under 37 CFR 1.138 to expressly abandon an application to avoid publication of the application.
Box PGPUB DRAWINGS	Drawings to be included in a patent application publication (replacement drawings for drawings included with a patent application on filing).
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box RCE	Requests for continued examination under 37 CFR 1.114.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or application number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

Please address mail to be delivered by the United States Postal Service (USPS) as follows:

Box _____
FEE (or NO FEE)
Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOUs) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

The following special box designations are applicable to both patent and trademark related mail, and the recommendations for "Special Boxes for Patent Mail" (above) should be followed for the types of mail listed below.

Please address mail to be delivered by the United States Postal Service (USPS) as follows (unless otherwise instructed):

Box _____
Director - U.S. Patent and Trademark Office
Washington, D.C. 20231

Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation* and disciplinary proceedings; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Mail related to refund requests.
Box 17	Invoices directed to the Office of Finance.
Box 24	Mail for the Office of Independent Inventor Programs.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M Correspondence	Correspondence related to maintenance fees other than payments of maintenance fees in patents. Payments of maintenance fees in patents not submitted electronically over the Internet at www.uspto.gov should be mailed to: United States Patent and Trademark Office P.O. Box 371611 Pittsburgh, PA 15250-1611
Box OED	Mail for the Office of Enrollment and Discipline.
Deposit Account Replenishments	To send payment to replenish deposit accounts Commissioner of Patents and Trademarks P.O. Box 70541 Chicago, IL 60673
Refund Requests	To send refund requests Commissioner of Patents and Trademarks Box 16 Washington, D.C. 20231

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information for the U.S. Patent and Trademark Office. Many PTDLs have on file patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs receive both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office* and numerical sets of patents in a variety of formats. Patent and trademark search systems in the Cassis optical disk series are available at all PTDLs to increase access to that information. It is through the optical disk systems and other depository materials that preliminary patent and trademark searches may be conducted through the numerically arranged collections.

Each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials.

All information is available for use by the public free of charge. However, there may be charges associated with the use of on-line systems, photocopying and related services.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

Partnership PTDLs provide enhanced and expanded services for which fees are charged. They offer on-line patent text and image searching, on-line trademark searching, and videoconferencing for examiner interviews and workshops. They accept disclosure documents on site, order file wrappers, assignment documents and certified copies for their customers, and host a variety of seminars aimed at specific audiences, including practitioners, paralegals, and independent inventors. Currently, partnerships are located at the Great Lakes Patent and Trademark Center (GLPTC) at the Detroit Public Library in Detroit, Michigan and the Sunnyvale Center for Innovation, Invention and Ideas (SCI^3) at the Sunnyvale Public Library in Sunnyvale, California.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(334) 844-1737
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(480) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7300
Colorado	Denver Public Library	(303) 640-6220
Connecticut	Hartford Public Library	(860) 543-8628
	New Haven Free Public Library	(203) 946-8130
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(954) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(765) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 242-6541
Kansas	Wichita: Ablah Library, Wichita State University	(316) 978-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(225) 388-8875
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan	(734) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(231) 591-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 630-6120
Mississippi	Jackson: Mississippi Library Commission	(601) 961-4111
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Las Vegas - Clark County Library District	(702) 733-1165
	Reno: University of Nevada, Reno Library	(775) 784-6500 Ext. 257
New Hampshire	Concord: New Hampshire State Library	(603) 271-2239
New Jersey	Newark Public Library	(973) 733-7779
	Piscataway: Library of Science and Medicine, Rutgers University	(732) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412

Reference Collections of U.S. Patents and Trademarks Available for Public Use In Patent and Trademark Depository Libraries—(continued)

State	*Name of Library*	*Telephone Contact*
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101
	Rochester Public Library	(716) 428-8110
	New York Public Library (The Research Libraries)	(212) 592-7000
	Stony Brook: Engineering Library, State University of New York	(631) 632-7148
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-2935
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron - Summit County Public Library	(330) 643-9075
	Cincinnati and Hamilton County, Public Library of	(513) 369-6971
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-3022
	Dayton: Paul Laurence Dunbar Library, Wright State University	(937) 775-3521
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburg, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-6369
Puerto Rico	Mayaquez General Library, University of Puerto Rico	(787) 832-4040 Ext. 2022
	Bayamon, Learning Resources Center, University of Puerto Rico	(787) 786-5225
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(864) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-1275
Tennessee	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2717
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(979) 845-5745
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 348-5483
	Lubbock: Texas Tech University	(806) 742-2282
	San Antonio Public Library	(210) 207-2500
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Vermont	Burlington: Bailey/Howe Library, University of Vermont	(802) 656-2542
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-4695 Ext. 5113
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Cheyenne: Wyoming State Library	(307) 777-7281

PATENT TECHNOLOGY CENTERS

JAMES E. ROGAN, Under Secretary of Commerce for Intellectual Property and
Director of the United States Patent and Trademark Office
NICHOLAS P. GODICI, Commissioner for Patents
ESTHER M. KEPPLINGER, Deputy Commissioner for Patent Operations
STEPHEN G. KUNIN, Deputy Commissioner for Patent Examination Policy
EDWARD R. KAZENSKE, Deputy Commissioner for Patent Resources and Planning

TECHNOLOGY CENTERS		CUSTOMER SERVICE TELEPHONE and FAX NUMBERS AREA CODE 703	NEW CASE DATE*
1600	**BIOTECHNOLOGY, ORGANIC**		
1610	Organic chemistry, bio-affecting and body treating composition	308-0198 FAX 872-9305	09/19/00
1620	Carbohydrates, Nonheterocyclic Chemistry and Uses	308-0198 FAX 872-9305	03/21/00
1630	Recombinant molecular and microbiology, multicellular organisms	308-0198 FAX 872-9305	08/03/00
1640	Immunology and Plants	308-0198 FAX 872-9305	05/04/00
1650	Non-recombinant molecular and microbiology, non-immuno proteins and peptides	308-0198 FAX 872-9305	08/04/00
1660	Asexually Reproduced Plants	308-0198 FAX 872-9305	12/21/00
1700	**CHEMICAL, MATERIALS ENGINEERING**		
1710	Synthetic resins	306-5665 FAX 872-9309	03/09/00
1720	Fluid separation and agitation, metal foundry, welding, plastic molding apparatus, fuels and related compositions	306-5665 FAX 872-9309	08/07/00
1730	Glass and paper making, tobacco, non-metallic molding, adhesive bonding, tires and coating apparatus	306-5665 FAX 872-9309	03/08/00
1740	Metallurgy, electrochemistry, cleaning, disinfecting, sterilizing, analytical chemistry and wave energy	306-5665 FAX 872-9309	11/05/99
1750	Chemical products and processes, solar cells and sputtering apparatuses	306-5665 FAX 872-9309	05/17/00
1760	Food technology, petroleum processing, coating and etching	306-5665 FAX 872-9309	04/20/00
1770	Stock materials and miscellaneous articles	306-5665 FAX 872-9309	02/07/00
2100	**COMPUTER ARCHITECTURE, SOFTWARE, ELECTRONIC COMMERCE**		
2120	Miscellaneous computer applications	306-5631 FAX 746-7240	01/06/99
2130	Cryptography, security	306-5631 FAX 746-7240	02/02/99
2150	Computer networks	306-5631 FAX 746-7240	09/16/98
2160	Electronic commerce	306-5631 FAX 746-7240	05/11/99
2170	Graphical user interface, data bases	306-5631 FAX 746-7240	04/16/99
2180	Computer architecture	306-5631 FAX 746-7240	05/07/99
2600	**COMMUNICATIONS**		
2610	Television	306-0377 FAX 872-9313	01/05/98
2620	Image analysis, fax	306-0377 FAX 872-9313	10/27/98
2630	Digital, optical, and general communications	306-0377 FAX 872-9313	10/20/98

TECHNOLOGY CENTERS		CUSTOMER SERVICE TELEPHONE and FAX NUMBERS AREA CODE 703	NEW CASE DATE*
2640	Audio, speech processing and wired telephone	306-0377 FAX 872-9313	06/15/98
2650	Dynamic information storage and retrieval	306-0377 FAX 872-9313	06/30/99
2660	Mutiplex communication	306-0377 FAX 872-9313	06/30/00
2670	Computer graphics and display systems	306-0377 FAX 872-9313	06/07/99
2680	Radio Telecommunications	306-0377 FAX 872-9313	05/24/99
2800	**SEMICONDUCTORS, ELECTRICAL AND OPTICAL SYSTEMS AND COMPONENTS**		
2810	Static memory and digital logic	306-3329 RF FAX 872-9317	02/28/00
2820	Semiconductors and electrical circuits	306-3329 RF FAX 872-9317	05/31/00
2830/ 2840	Power generation and distribution, music, electrical components and control circuits	306-3329 RF FAX 872-9317	12/21/99
2850/ 2860	Photocopying, recorders, measuring and testing, printing	306-3329 RF FAX 872-9317	11/08/99
2870/ 2880	Liquid crystals, optical elements, optical systems, fiber optics, lasers, electric lamps, registers, optics measuring and radiant energy	306-3329 RF FAX 872-9317	07/23/99
3600	**TRANSPORTATION, CONSTRUCTION, AGRICULTURE, LICENSING AND REVIEW**		
3610	Surface transportation	306-5771 FAX 872-9325	11/16/00
3620	Closures, connections, hardware, sign exhibiting and furniture	306-5771 FAX 872-9325	08/16/00
3630	Static structures, supports and furniture	306-5771 FAX 872-9325	08/10/00
3640	Aeronautics, agriculture, plant and animal husbandry, weaponry, nuclear systems, license and review	306-5771 FAX 872-9325	08/31/00
3650	Material handling	306-5771 FAX 872-9325	08/11/00
3660	Computerized vehicle controls and navigation, radio wave and acoustic wave communication	306-5771 FAX 872-9325	10/10/00
3670	Wells, earth boring/moving/working, excavating, mining harvesters, bridges, roads, petroleum	306-5771 FAX 872-9325	10/02/00
3680	Machine elements and power transmissions	306-5771 FAX 872-9325	09/18/00
3700/ 2900	**MECHANICAL ENGINEERING, MANUFACTURING AND PRODUCTS, DESIGNS**		
3710	Amusement and education devices	306-5648 FAX 872-9301	02/24/00
3720	Packages and containers, manufacturing devices and processes, machine tools and hand tools	306-5648 FAX 872-9301	02/09/00
3730	Medical instruments, diagnostic equipment, treatment devices, surgery and surgical supplies	306-5648 FAX 872-9301	08/21/00
3740	Thermal and combustion technology, motive and fluid power systems	306-5648 FAX 872-9301	07/28/00
3750	Fluid handling and dispensing, textile manufacturing and apparel	306-5648 FAX 872-9301	04/04/01
3760	Body treatment, kinestherapy, and exercising	306-5648 FAX 872-9301	09/20/00
2900	Designs	306-5648 FAX 872-9321	02/27/01

* A communication from the examiner should have been received in most applications filed prior to this date.

TRADEMARK OPERATION

James E. Rogan, Director of the United States Patent and Trademark Office
Ann Chasser, Commissioner for Trademarks
Condition of Trademark Applications as of May 1, 2002

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Jerry Price, Managing Attorney, (703) 308-9101—North Tower, 10th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	01/25/01	07/13/01
Law Office 102—Thomas Shaw, Managing Attorney, (703) 308-9102—South Tower, 5th Floor, Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	11/01/01	10/12/01
Law Office 103—Michael Hamilton, Managing Attorney, (703) 308-9103—North Tower, 4th Floor, Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	01/10/021	01/10/02
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—South Tower, 6th Floor, Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	01/18/02	12/10/01
Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—South Tower, 3rd Floor, Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	02/07/02	09/04/01
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—North Tower, 6th Floor, Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	01/14/02	10/05/01
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—North Tower, 7th Floor, Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	01/15/02	01/25/02
Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—South Tower, 8th Floor, Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	01/23/02	01/10/02
Law Office 109—Ronald Sussman, Managing Attorney, (703) 308-9109—South Tower, 8th Floor, Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	01/23/02	01/30/02
Law Office 110—Christopher A. F. Pedersen, Managing Attorney, (703) 308-9110—South Tower, 7th Floor, Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	01/05/02	02/08/02
Law Office 111—Kevin Peska, Managing Attorney, (703) 308-9111—North Tower, 10th Floor, Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	02/04/02	05/20/02
Law Office 112—Janice O'Lear, Managing Attorney, (703) 308-9112—South Tower, 5th Floor, Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	11/01/01	01/02/02
Law Office 113—Odette Bonnet, Managing Attorney, (703) 308-9113—North Tower, 4th Floor, Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	04/17/02	03/01/02
Law Office 114—Margaret Le, Managing Attorney, (703) 308-9114—South Tower, 6th Floor, Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	12/02/01	11/20/01
Law Office 115—Tomas Vlcek, Managing Attorney, (703) 308-9115—North Tower, 3rd Floor, Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	12/17/01	03/26/01

Law Office 116—Meryl Hershkowitz, Managing Attorney, (703) 308-9116—North Tower, 4th Floor, Chemicals, Paints, Cosmetics, Lubricants, Pharmaceuticals, Unwrought metals, Industrial Equipment, Tools, Scientific Equipment, Medical Apparatus, Installation, Vehicles, Firearms, Precious metals, musical instruments, paper products, fibers, leather goods, building materials, furniture, Housewares, Cordage, Yarns, Fabrics, Clothing, Notions, floor coverings, toys, Foods, Beverages, Wines, Spirits & tobacco—Int. Classes 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34		
Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	11/15/01	10/10/01
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Ronald Williams, Director, (703) 305-1222		
Trademark Assistance Center—(703) 308-9000		
Pre-Examination—Robin Lewis, Manager, (703) 308-9401 ext. 188		
Intent-To-Use—(ITU)—(703) 308-9500		
Post Registration Section—Lashawn Lee, Supervisor (703) 308-9500 ext. 152		
Affidavits Under Sections 8 & 15 (All Classes)	02/22/02	—0—
Renewals (All Classes)	02/19/02	—0—
Section 12(c) Publications (All Classes)	04/01/02	—0—

1. ** Assigned to all Law Offices

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305-8747 through (703) 305-9752 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

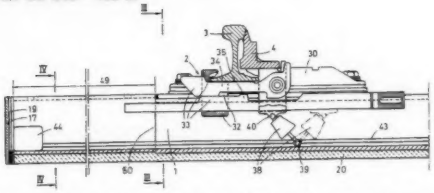
3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

JUNE 25, 2002

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

US 5,562,267 C1 (4604th)
CROSS-TIES FOR RAILROAD TRACK SYSTEMS
Armin Heim, Kreuzlingen, Switzerland; K. Ohm, Schwabach, Germany; K. Spiegel, Hassfurt, Germany; Rudolf Köpl, Munich, Germany; Jurgen Kruger, Wunstorf, Germany; Volker Klein, Hamburg, Germany, and Hans-Joachim Scholte, Iserlohn, Germany, assignors to Schwihag GmbH, Tagerwilen, Switzerland, and Deutsche Bahn AG, Minden, Germany
Reexamination Request No. 90/005,989, Apr. 25, 2001.
Reexamination Certificate for Patent 5,562,267, issued Oct. 8, 1996, Appl. No. 237,365, May 5, 1994.
Claims priority, application Germany, May 7, 1993, 43 15 200
Int. Cl. E01B *7/00*
U.S. Cl. 246—415 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–20** is confirmed.

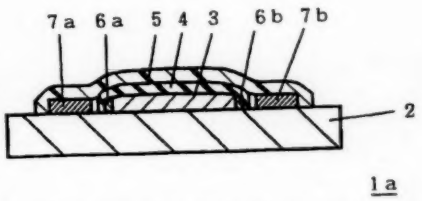
1. A sleeper for railway track systems, comprising a steel box-like sleeper section member (**5**) having an upper open part (**31**) and a bottom closed part, which said member has a cross-sectional width (**15**) and a cross-sectional height (**16**) matching that of a concrete or wooden sleeper and which has laterally projecting bearing flanges (**13** and **14**) for mounting points-tongue slide chairs (**30**) and/or associated operating components of tip fasteners, an upper portion of the box-like sleeper section member (**5**) supporting said tip fasteners in the form of latch fasteners (**33**), comprising holders (**32**), movable latches (**34**), cam rods (**35**) and cam-rod guides, fitted into the upper or open part (**31**) of the box-like sleeper section member (**5**), whereas the bottom part houses points-tongue slide rods (**54**), tongue-monitoring linkage (**45**), a basin (**46**) for points drive, heating rods (**43**) and shock-absorbing elements (**38**).

US 5,712,610 C1 (4605th)
PROTECTIVE DEVICE
Motohide Takeichi; Norikazu Iwasaki, and Yuji Furuuchi, all of Kanuma, Japan, assignors to Sony Chemicals Corp., Tokyo, Japan
Reexamination Request No. 90/005,834, Nov. 2, 2000.
Reexamination Certificate for Patent 5,712,610, issued Jan. 27, 1998, Appl. No. 562,685, Nov. 27, 1995.
Claims priority, application Japan, Aug. 19, 1994, 6-195565; Nov. 30, 1994, 6-323559
Int. Cl. H01H *85/04;69/02*
U.S. Cl. 337—290

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–15** is confirmed.

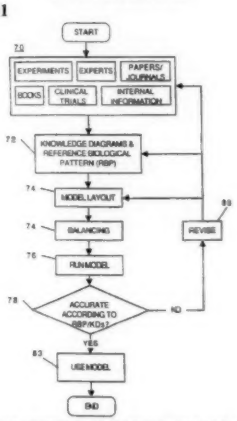
12. An overcurrent-preventive protective device comprising a substrate, a low-melting metal piece provided on the substrate, an inner sealing portion which is formed of a material having a lower melting point or lower softening point than the low-melting metal piece and seals the low-melting metal piece, and an outside casing



1a

that covers the inner sealing portion, leaving a gap between the outside casing and the inner sealing portion.

US 5,808,918 C1 (4606th)
HIERARCHICAL BIOLOGICAL MODELLING SYSTEM AND METHOD
Pamela K. Fink; Kenneth S. Kornman, both of San Antonio, Tex.; Samuel Holtzman, Cupertino, and Thomas S. Paterson, Woodside, both of Calif., assignors to Interleukin Genetics, Inc., San Antonio, Tex., and Entelos, Inc., Menlo Park, Calif.
Reexamination Request No. 90/005,700, Apr. 5, 2000.
Reexamination Certificate for Patent 5,808,918, issued Sep. 15, 1998, Appl. No. 882,597, Jun. 25, 1997.
Continuation of application No. 08/422,175, filed on Apr. 14, 1995, now Pat. No. 5,657,255.
Int. Cl. G06G *7/48*
U.S. Cl. 703—11



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–5** is confirmed.

1. A computer executable model of a hierarchical biological system, the model for use with a computer system including a memory and a processor, the model comprising:

a plurality of biological modelling units stored in the memory, each biological modelling unit having:

a plurality of chemical level inputs, each input representing a level of a chemical in an environment containing the biological modelling unit;

at least one chemical production output representing a level of a chemical produced by the biological modelling unit and stored as part of the environment containing the biological modelling unit; and

a chemical production function describing the production output of a chemical by the biological modelling unit as a function of the chemical level inputs; and

the plurality of biological modelling units organized into a plurality of levels, each level representing a different level of biological function, each biological modelling unit in any level providing its chemical production outputs to the environment containing the biological modelling unit, receiving as its chemical level input, chemical levels from the environment, and wherein execution of the model by the processor modifies the respective inputs and outputs of each of the biological modelling units.

REISSUES

JUNE 25, 2002

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

US RE37,758 E

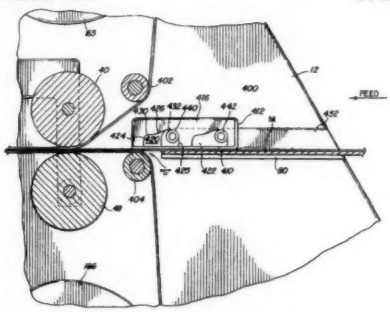
MASTER PROCESSING APPARATUS WITH MASTER ENGAGING STRUCTURE FOR TENSIONING A MASTER

Franklin C. Bradshaw, Scottsdale, and Michael W. Paque, Cave Creek, both of Ariz., assignors to Xyron, Inc., Scottsdale, Ariz.

Original No. 5,788,806, dated Aug. 4, 1998, Appl. No. 08/753,921, filed on Dec. 3, 1996. Continuation-in-part of application No. 08/354,222, filed on Dec. 12, 1994, now Pat. No. 5,580,417, which is a continuation-in-part of application No. 08/247,003, filed on May 20, 1994, now Pat. No. 5,584,962. This application Aug. 2, 2000, Appl. No. 630,560.

Int. Cl. B32B *31/00*

U.S. Cl. 156—539 **64 Claims**



1. A [paddle for a] master substrate processing apparatus [in which] *for processing* a master substrate [is fed into a nip roll area to be processed], said [paddle] comprising:

[(a) a tray disposed adjacent said nip area having a generally planar tray surface for receiving a master;

(b) a paddle having a platen surface disposed above said tray;

(c) means for moving said paddle between a first position elevated above said tray and a second position disposed against said tray; and

(d) said platen surface having a first area having characteristics of non-stick and a second area for applying a predetermined resistance to a master in contact with the platen surface]

a first supply roll comprising a wound supply of a first stock material carrying a layer of adhesive;

a second supply roll comprising a wound supply of a second stock material;

a master substrate processing assembly having structure constructed and arranged to process said master substrate and said unwound portions of said stock materials during advancement thereof in a feeding direction through said processing assembly to affect adhesive bonding between said master substrate and said adhesive;

structure providing a master substrate supporting surface adjacent a feed site of said master processing assembly to support the master substrate thereon as the master substrate is being fed into said master substrate processing assembly; and

a master substrate engaging structure extending generally transversely across said master substrate supporting surface, said master substrate engaging structure having a master substrate engaging surface that engages the master substrate while supported on said master substrate supporting surface so as to apply frictional resistance to advancement of the master substrate in said feeding direction thereby tension the master substrate.

US RE37,759 E

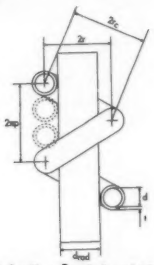
COILED MEMBRANE FILTRATION SYSTEM

Georges Belfort, Slingerlands, N.Y., assignor to Rensselaer Polytechnic Institute, Troy, N.Y.

Original No. 5,626,758, dated May 6, 1997, Appl. No. 08/512,567, filed on Aug. 8, 1995. Application for reissue Apr. 22, 1999, Appl. No. 298,519.

Int. Cl. B01D *69/04;69/08*

U.S. Cl. 210—636 **25 Claims**



1. A method of defouling [and depolarizing] an inner surface of a hollow curved tubular membrane [which comprises], *comprising the step of:*

moving a fluid containing a *liquid component and a fouling component, said fouling* component selected from the group consisting of [a solute,] solid particles and a mixture of a solute and solid particles, *through the curved tubular membrane, said membrane having an inner surface and an outer surface, whereby a portion of the liquid component is filtered by passing from the inner surface to the outer surface of said membrane, said fluid being directed through the curved tubular membrane at a rate sufficient* to produce Dean vortices in the fluid which move across said inner surface of said tubular membrane *and at least partially defoul the inner surface of the membrane of solid particles filtered from the liquid component.*

US RE37,760 E

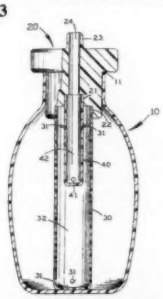
DUST DISPENSING SYSTEM FOR USE IN SQUEEZE-TYPE DUST DISPENSERS

Tom B. Mathison, North Lauderdale, and Joseph B. Budz, Coral Springs, both of Fla., assignors to Pestop Commercial Pest Prevention, North Lauderdale, Fla.

Original No. 5,971,234, dated Oct. 26, 1999, Appl. No. 09/143,337, filed on Aug. 28, 1998. Application for reissue Dec. 9, 1999, Appl. No. 458,052.

Int. Cl. B05B *11/06*

U.S. Cl. 222—633 **20 Claims**



5. A powdered product mixing and dispensing device comprising:

a squeeze-type container for receiving powdered product;

a plug creating an airtight seal with said container, said plug having a bore therethrough;

a hollow outlet tube open at its top end and closed at its bottom end, said top end of said outlet tube being seatingly held by said plug, said outlet tube defining a first chamber communicating with said bore;

a hollow dip tube open at its top end and closed at its bottom end, said top end of said dip tube being seatingly held by said plug whereby said dip tube defines a second chamber; and

vent holes in said outlet tube and said dip tube, said vent holes providing communication between said first and second chambers and between said second chamber and the interior of said container.

US RE37,761 E

CHARACTER DISPLAY APPARATUS FOR AN INTELLIGENCE TELEVISION

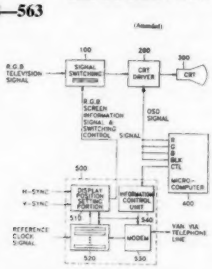
Dong-Cherl Back, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Original No. 5,734,437, dated Mar. 31, 1998, Appl. No. 08/731,310, filed on Oct. 15, 1996. Application for reissue Mar. 31, 2000, Appl. No. 539,609.

Claims priority, application Rep. of Korea, Oct. 13, 1995, 95-35288

Int. Cl. H04N *5/445*

U.S. Cl. 348—563 **52 Claims**



12. An information data display apparatus for driving a video display device capable of selectively or simultaneously displaying visual images corresponding to a television broadcast signal or information data supplied via a network, said apparatus comprising:

an information processing system receiving said information data from said network and providing a screen information signal corresponding to said information data;

a signal switch providing a corresponding selected signal by selectively switching between said screen information signal and said television broadcast signal; and

a display driver providing said corresponding selected signal to drive the video display device in response to reception of said corresponding selected signal.

US RE37,762 E

SCANNING EXPOSURE APPARATUS AND EXPOSURE METHOD

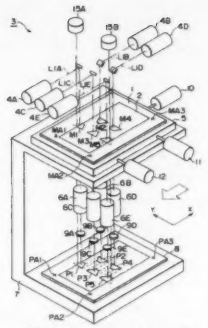
Seiji Miyazaki; Kei Nara, both of Yokohama; Masami Seki, Shiki; Masamitsu Yanagihara, and Tomohide Hamada, both of Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Original No. 5,602,620, dated Feb. 11, 1997, Appl. No. 08/490,212, filed on Jun. 14, 1995. Continuation-in-part of application No. 08/420,818, filed on Apr. 12, 1995, now abandoned. Application for reissue Feb. 11, 1999, Appl. No. 247,857.

Claims priority, application Japan, Apr. 12, 1994, 6-73097; Jun. 16, 1994, 6-158126; Aug. 8, 1994, 6-205975

Int. Cl. G03B *27/42;27/44;27/32;27/70;* **G01B** *11/00*

U.S. Cl. 355—53 **44 Claims**



15. A scanning exposure apparatus comprising:

a carriage integrally holding a mask and a substrate;

a sub-stage provided on the carriage, the sub-stage being driven to adjust relative positions of the mask and of the substrate while the mask and the substrate are integrally held by the carriage; and

an image transfer system that transfers a pattern on the mask onto the substrate by using a transfer area having an oblique portion, the image transfer system overlapping portions of the pattern utilizing the oblique portion of the transfer area while moving the mask and the substrate synchronously.

US RE37,763 E

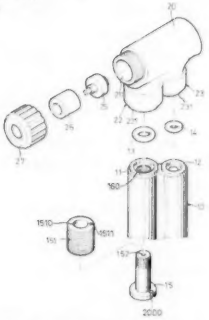
STRUCTURE FOR CONNECTING A HEAD TO A NON-CIRCULAR CYLINDER OF A BICYCLE TIRE PUMP

Scott Wu, No. 2, Lane 187, Hsi Hu Road, Ta Li City, Taichung Hsien, Taiwan

Original No. 6,050,791, dated Apr. 18, 2000, Appl. No. 09/124,778, filed on Jul. 30, 1998. Application for reissue Jul. 18, 2000, Appl. No. 631,350.

Int. Cl. F04B *23/00;39/10*

U.S. Cl. 417—521 **24 Claims**



11. A bicycle tire pump comprising:

a cylinder including a non-circular outer periphery, the cylinder including an interior;

at least a first piston movably received in the interior of the cylinder;

a head directly mounted on top of the cylinder in a nonrotatable manner and including an outlet that is communicated with the interior of the cylinder; and

means mounted in the interior of the cylinder and having a first end securely retained in the interior of the cylinder and a second end extended beyond the cylinder for securely engaging with the head, with the head and the outlet being separable from the cylinder only by removal of the engaging means.

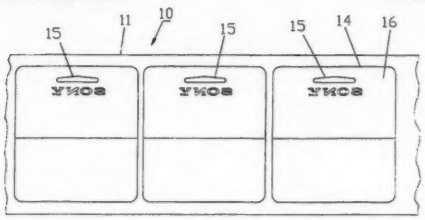
US RE37,764 E
PRODUCT DISPLAY HANGER AND PROCESS

David M. Good, Peachtree City, Ga., assignor to Voxcom, Inc., Peachtree City, Ga.

Original No. 5,728,440, dated Mar. 17, 1998, Appl. No. 08/650,737, filed on May 20, 1996. Continuation-in-part of application No. 08/318,255, filed on Oct. 5, 1995, now abandoned. Application for reissue Feb. 2, 2000, Appl. No. 496,866.

Int. Cl. B65D *85/575*

U.S. Cl. 428—40.1 **6 Claims**



1. A hanging system for suspending a package of products from a single wire hanger and/or a double wire hanger and for automatic labeling of product packaging, said hanging system [consisting of] *comprising*:

a hang tag formed of [recyclable,] transparent, sheet resin[,] material and having a front side and a back side, an upper portion and a lower portion,

a hanging region and a billboard region on said upper portion of said hang tag, said hanging region having one opening in the form of a squat, isosceles triangle for engaging a single or a double [hanger] wire *hanger,*

a back side of said upper portion having said billboard region having an image containing graphics or advertising material printed on said upper portion of said back side, and covered with an [ultraviolet cured,] opaque ink coating for protecting said graphics or advertising material, and,

an adhering region on said lower portion *of the* front side, said adhering region having a [0.75 Mil] coating of a clear, [hot melt,] pressure sensitive adhesive.

US RE37,765 E
PROCESS FOR PREPARING A NONCONDUCTIVE SUBSTRATE FOR ELECTROPLATING

Catherine M. Randolph, Hamden, Conn., and Barry F. Nelsen, Mountain Lake, N.J., assignors to MacDermid, Incorporated, Waterbury, Conn.

Original No. 5,139,642, dated Aug. 18, 1992, Appl. No. 07/747,066, filed on Aug. 19, 1991. Continuation-in-part of application No. 07/694,517, filed on May 1, 1991, now abandoned. Application for reissue Feb. 22, 1999, Appl. No. 255,491.

Int. Cl. C25D *5/02;5/54*

U.S. Cl. 428—408 **23 Claims**

1. A process for electroplating a conductive metal layer to the surface of a nonconductive material, comprising the following steps:

(a) contacting said nonconductive surface with a liquid carbon black dispersion comprising:

(1) carbon black particles having an average particle diameter of less than about 3.0 microns in said dispersion;

(2) an effective dispersing amount of a surfactant which is compatible with said carbon black; and

(3) a first liquid dispersing medium, wherein the amount of carbon black is sufficient to coat substantially all of said nonconducting surfaces and is less than about 4% by weight of said liquid carbon black dispersion;

(b) separating substantially all of said first liquid dispersing medium from said carbon black particles, whereby said particles are deposited on said nonconductive surface in a substantially continuous layer; and

(c) contacting said carbon black-coated nonconductive surface with a liquid conductive graphite dispersion comprising:

(1) conductive graphite particles having an average particle diameter of less than about 1.5 microns in said dispersion;

(2) an effective dispersing amount of a surfactant which is compatible with said conductive graphite; and

(3) a second liquid dispersing medium, wherein the amount of conductive graphite is less than about 4% by weight of said liquid conductive graphite dispersion;

(d) separating substantially all of said second liquid dispersing medium from said conductive graphite particles, whereby said particles are deposited on said carbon black-coated nonconductive surface; and

(e) electroplating a substantially continuous conductive metal layer over the deposited carbon black layer and the deposited conductive graphite layer and said nonconductive surface.

21. [The] *A* nonconductive surface [of claim **20**] *covered with a deposit of a substantially continuous layer of carbon black having an average particle diameter of less than about 3.0 microns thereon and a layer of conductive graphite having an average particle diameter of less than about 1.5 microns deposited over said carbon black deposit,* wherein said nonconductive surface comprises at least one through hole of a printed wiring board.

US RE37,766 E
K. LACTIS PYRUVATE-DECARBOXYLASE PROMOTER AND USE THEREOF

Sandrine Menart, Bagneux, and Monique Bolotin, Gif sur Yvette, both of France, assignors to Aventis Pharma S.A., Antony Cedex, France

PCT No. PCT/FR93/00694, § 371 Date Feb. 1, 1995, § 102(e) Date Feb. 1, 1995, PCT Pub. No. WO94/01569, PCT Pub. Date Jan. 20, 1994

Original No. 5,631,143, dated May 20, 1997, Appl. No. 08/362,511, filed on Feb. 1, 1995. This PCT application Jul. 6, 1993, Appl. No. 639,430.

Claims priority, application France, Jul. 8, 1992, 92 08428

Int. Cl. C12P *21/02;* **C12N** *15/14;15/81;* **C07N** *21/04*

U.S. Cl. 435—69.1 **12 Claims**

1. [A] *An isolated* DNA sequence selected from the group consisting of:

(a) the sequence presented in SEQ ID NO:1 or SEQ ID NO:4;

(b) a complementary strand of the sequence presented in SEQ ID NO:1 or SEQ ID NO:4; and

(c) a fragment of the sequence of (a) or (b); wherein said DNA sequence possesses transcriptional promoter activity.

US RE37,767 E
HIGHLY STABLE RECOMBINANT YEASTS FOR THE PRODUCTION OF RECOMBINANT PROTEINS

Reinhard Fleer, Orsay; Alain Fournier, Chatenay-Malabry, and Patrice Yeh, Gif sur Yvette, all of France, assignors to Aventis Pharma S.A., Antony Cedex, France

PCT No. PCT/FR92/00769, § 371 Date May 20, 1994, § 102(e) Date May 20, 1994, PCT Pub. No. WO93/03159, PCT Pub. Date Feb. 18, 1993

Original No. 5,593,858, dated Jan. 14, 1997, Appl. No. 08/190,103, filed on May 20, 1994. This PCT application Aug. 3, 1992, Appl. No. 640,304.

Claims priority, application France, Aug. 2, 1991, 91 09854

Int. Cl. C12P *21/02;* **C12N** *1/15;15/81*

U.S. Cl. 435—69.1 **27 Claims**

3. A host/vector pair which is stable in a complex medium, wherein the host is a yeast of the Kluyveromyces genus lacking a functional phosphoglycerate kinase gene, and wherein the vector comprises a functional copy of the phosphoglycerate kinase gene.

6. The host/vector pair according to claim **3**, wherein the vector additionally comprises a DNA sequence encoding a desired protein, and signals permitting expression of said sequence.

22. The host/vector pair according to claim **6** wherein the signals enabling the expression of the **[**second**]** DNA sequence are selected from the group consisting of transcription promoters and terminators.

US RE37,768 E
DNA ENCODING THE 15 KD OUTER MEMBRANE PROTEIN OF *HAEMOPHILUS INFLUENZAE*

Bernard R. Brodeur; Josee Hamel, both of 2401 Maritain, Sillery, Quebec, Canada, G1T 1N6; Robert S. Munson, Jr., 4825 Canterwood Ct., Hilliard, Ohio 43026, and Susan Grass, 4555 Southridge Pines Dr., St Louis, Mo. 63128

Original No. 5,503,992, dated Apr. 2, 1996, Appl. No. 08/061,314, filed on Sep. 7, 1993. Application for reissue Apr. 2, 1998, Appl. No. 53,945.

Int. Cl. A61K *39/02;39/102;* **C07H** *21/02;* **C12P** *21/06*

U.S. Cl. 435—69.3 **21 Claims**

6. A recombinant polynucleotide encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:2.

7. The recombinant polynucleotide of claim 6, comprising the nucleotide sequence of SEQ ID NO:3.

8. A recombinant polynucleotide encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:4.

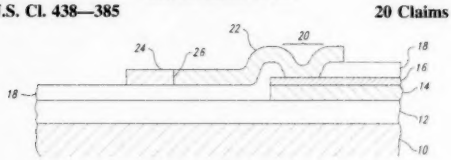
US RE37,769 E
METHODS FOR FABRICATING MEMORY CELLS AND LOAD ELEMENTS

James Brady, Dallas; Tsiu Chiu Chan, Carrollton, and David Scott Culver, The Colony, all of Tex., assignors to STMicroelectronics, Inc., Carrollton, Tex.

Original No. 5,151,387, dated Sep. 29, 1992, Appl. No. 07/516,272, filed on Apr. 30, 1990. Application for reissue Sep. 29, 1994, Appl. No. 316,035.

Int. Cl. H01L *21/20*

U.S. Cl. 438—385 **20 Claims**



8. A method of fabricating an SRAM cell, comprising the steps of:

fabricating first and second driver transistors and first and second pass transistors, said driver transistors each being N-channel field-effect transistors and having respect gates, sources, and drains;

connecting said gate of said driver transistor to said drain of second driver transistor, and connecting said gate of said second driver transistor to said drain of said first driver transistor, using a polycide layer comprising a lower polysilicon portion which is doped n-type polysilicon and an upper silicide portion;

providing an additional patterned polysilicon layer which includes both heavily doped n-type regions and lightly doped p-type regions,

said heavily doped n-regions of said additional polysilicon layer being connected directly to a positive power supply voltage, and

said lightly doped p-type regions of said additional polysilicon layer making ohmic contact directly to said silicide portion of said polycide layer to provide pull-up connections to said drains of said driver transistors.

US RE37,770 E
TREATMENT OF SKIN CONDITIONS BY USE OF PPARα ACTIVATORS

Peter M. Elias, Mill Valley; Nathan N. Bass, San Francisco; Karen Hanley, Mill Valley, and Kenneth R. Feingold, San Rafael, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Original No. 6,060,515, dated May 9, 2000, Appl. No. 09/101,366, filed on Jun. 16, 1999. Continuation-in-part of application No. PCT/US98/01276, filed on Jan. 22, 1998, which is a continuation of application No. 08/788,973, filed on Jan. 24, 1997, now abandoned. Application for reissue Jan. 8, 2001, Appl. No. 756,828.

Int. Cl. A61K *31/20*

U.S. Cl. 514—560 **10 Claims**

1. A method for treating the epidermis of a terrestrial mammalian subject suffering from a perturbed epidermal barrier function, said method comprising topically applying to said epidermis a topical composition comprising an activator of peroxisome proliferator-activated receptor α *selected from the group consisting of 5,8,11,14-eicosatetraynoic acid, (4-chloro-6-(2,3-xylidino)-2-pyrimidinyl)thioacetic acid, cloribrate, and gemfibrozil* in an amount effective in enhancing barrier development.

US RE37,771 E
PURIFICATION OF CINNAMOYL-C-GLYCOSIDE CHROMONE

Todd Waller, Harlingen, Tex.; Qi Jia, Arvada, and Abeysinghe Padmapriya, Boulder, both of Colo., assignors to Univera Pharmaceuticals, Inc., Broomfield, Colo.

Original No. 5,675,000, dated Oct. 7, 1997, Appl. No. 08/621,178, filed on Mar. 21, 1996. Application for reissue Oct. 7, 1999, Appl. No. 414,478.

Int. Cl. C07H *1/08*

U.S. Cl. 536—128 **19 Claims**

1. A method for purifying **[**8-C-β-D-[2-O-(E)-cinnamoyl]glycopyranosyl-2-[(R)-2-hydroxy]propyl-7-methoxy-5-methyl-chromone**]** *8-C-β-D-[2'-O-(E)-cinnamoyl]glycopyranosyl-2-[(S)-2-hydroxy]propyl-7-methoxy-5-methylchromone* (the "540 compound"), comprising the steps of:

(a) contacting a decolorizing agent, which has been obtained from the processing of a slurry of an aloe leaf extract, with an organic solvent to extract the absorbed 540 compound from the decolorizing agent into the organic solvent, thereby forming a mixture of decolorizing agent and organic solvent containing the 540 compound; and

(b) separating the decolorizing agent from the organic solvent to yield a solution highly enriched in compound 540.

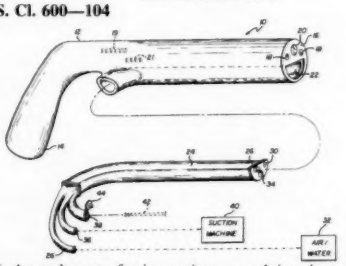
US RE37,772 E
ENDOSCOPE

Brian S. Kelleher, San Diego, Calif., assignor to Endonetics, Inc., San Diego, Calif.

Original No. 5,486,154, dated Jan. 23, 1996, Appl. No. 08/072,935, filed on Jun. 8, 1993. Application for reissue Jan. 20, 1998, Appl. No. 8,789.

Int. Cl. A61B *1/00*

U.S. Cl. 600—104 **38 Claims**



1. An endoscope for inspecting or applying therapy to an inner body cavity of a patient, including,

a shell,

illuminating means fixedly positioned in the shell,

imaging means fixedly positioned in the shell,

there being a lumen within the shell, and

a core removably disposed within the lumen in the shell in sealing relationship with the shell with the illuminating means and the imaging means exterior in the shell to the core,

the core *having proximal and distal ends and* including (*a*) a first passageway disposed *longitudinally* within the core *from the proximal end to the distal end* for providing for a removal of materials from the inner body cavity of the patient, *and* (*b*) *a second passageway disposed longitudinally within the core from the proximal end to the distal end for applying a fluid to selected areas of the shell or inner body cavity of the patient to clean such selected areas or to inflate such cavity with gas.*

PLANT PATENTS

GRANTED JUNE 25, 2002

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

US PP12,714 P2
DAHLIA PLANT NAMED 'DAHLSTAR PINK'
Henry Lommerse, Mariahout-Laarbeek, Netherlands, assignor to Kieft Seed Holland, Venhuizen, Netherlands
Filed Mar. 1, 2001, Appl. No. 795,469
Int. Cl. A01H *5/00*
U.S. Cl. Plt.—321 **1 Claim**

1. A new and distinct cultivar of Dahlia plant named 'Dahlstar Pink', as illustrated and described.

US PP12,715 P2
DAHLIA PLANT NAMED 'DAHLSTAR BURGUNDY'
Henry Lommerse, Mariahout-Laarbeek, Netherlands, assignor to Kieft Seed Holland, Venhuizen, Netherlands
Filed Mar. 1, 2001, Appl. No. 795,470
Int. Cl. A01H *5/00*
U.S. Cl. Plt.—321 **1 Claim**

1. A new and distinct cultivar of Dahlia plant named 'Dahlstar Burgundy', as illustrated and described.

US PP12,716 P2
DAHLIA PLANT NAMED 'SELECT WHITE'
Henry Lommerse, Mariahout-Laarbeek, Netherlands, assignor to Kieft Seed Holland, Venhuizen, Netherlands
Filed Mar. 1, 2001, Appl. No. 795,465
Int. Cl. A01H *5/00*
U.S. Cl. Plt.—321 **1 Claim**

1. A new and distinct cultivar of Dahlia plant named 'Select White', as illustrated and described.

US PP12,717 P2
DAHLIA PLANT NAMED 'AMAZON'
Henry Lommerse, Mariahout-Laarbeek, Netherlands, assignor to Kieft Seed Holland, Venhuizen, Netherlands
Filed Mar. 1, 2001, Appl. No. 795,462
Int. Cl. A01H *5/00*
U.S. Cl. Plt.—321 **1 Claim**

1. A new and distinct cultivar of Dahlia plant named 'Amazon', as illustrated and described.

US PP12,718 P2
STOKESIA LAEVIS PLANT NAMED 'COLORWHEEL'
Robert Mark Saul, 940 Carter Dr., Atlanta, Ga. 30319
Filed Nov. 13, 2000, Appl. No. 710,790
Int. Cl. A01H *5/00*
U.S. Cl. Plt.—263 **1 Claim**

1. A new and distinct variety of Stokesia plant named 'Colorwheel', as described and illustrated.

US PP12,719 P2
POINSETTIA PLANT NAMED 'RED ANGEL'
Lyndon W. Drewlow, Lompoc, Calif., assignor to Oglevee Ltd., Connellsville, Pa.
Filed Nov. 23, 1999, Appl. No. 447,598
Int. Cl. A01H *5/00*
U.S. Cl. Plt.—307 **1 Claim**

1. A new and distinct variety of poinsettia plant as herein shown and described.

US PP12,720 P2
COREOPSIS PLANT NAMED 'SWEET DREAMS'
Mark Alan Leonard, New Castle, Calif., assignor to Yoder Brothers, Inc.., Barberton, Ohio
Filed Jan. 18, 2001, Appl. No. 761,473
Int. Cl. A01H *5/00*
U.S. Cl. Plt.—263 **1 Claim**

1. A new and distinct cultivar of Coreopsis plant named 'Sweet Dreams', as illustrated and described.

US PP12,721 P2
POINSETTIA PLANT NAMED 'JACADIA'
Aase Jacobsen, Skibby, Denmark, assignor to Paul Ecke Ranch, Encinitas, Calif.
Filed Feb. 9, 2001, Appl. No. 779,347
Int. Cl. A01H *5/00*
U.S. Cl. Plt.—307 **1 Claim**

1. A new and distinct cultivar of Poinsettia plant named 'Jacadia', as illustrated and described.

US PP12,722 P2
POINSETTIA PLANT NAMED 'FISSON DARK RED'
Katharina Zerr, Höhr-Grenzhausen, Germany, assignor to Floris AG, Binningen, Switzerland
Filed Feb. 2, 2000, Appl. No. 496,459
Int. Cl. A01H *5/00*
U.S. Cl. Plt.—307 **1 Claim**

1. A new and distinct poinsettia plant named 'Fisson Dark Red', substantially as illustrated and described.

US PP12,723 P2
POINSETTIA PLANT NAMED 'FISCOR DARK RED'
Katharina Zerr, Höhr-Grenzhausen, Germany, assignor to Floris AG, Binningen, Switzerland
Filed Feb. 2, 2000, Appl. No. 496,196
Int. Cl. A01H *5/00*
U.S. Cl. Plt.—307 **1 Claim**

1. A new and distinct poinsettia plant named 'Fiscor Dark Red', substantially as illustrated and described.

US PP12,724 P2
LILY PLANT NAMED 'LOMBARDIA'
Cees A. van der Voort, Katwijk, Netherlands, assignor to Vletter & Den Haan Beheer B.V., Rijnsburg, Netherlands
Filed Jul. 19, 1999, Appl. No. 357,101
Int. Cl. A01H *5/00*
U.S. Cl. Plt.—315 **1 Claim**

1. A new and distinct cultivar of Lily plant named 'Lombardia', as illustrated and described herein.

US PP12,725 P2

POINSETTIA PLANT NAMED 'ECKADRIA'

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Encinitas, Calif.

Filed Feb. 9, 2001, Appl. No. 779,349

Int. Cl. A01H *5/00*

U.S. Cl. Plt.—303 1 Claim

1. A new and distinct cultivar of Poinsettia plant named 'Eckadria', as illustrated and described.

US PP12,726 P2

POINSETTIA PLANT NAMED 'ECKADONIA'

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Encinitas, Calif.

Filed Feb. 9, 2001, Appl. No. 779,339

Int. Cl. A01H *5/00*

U.S. Cl. Plt.—303 1 Claim

1. A new and distinct cultivar of Poinsettia plant named 'Eckadonia', as illustrated and described.

US PP12,727 P2

NEW GERANIUM PLANT NAMED 'FISHELEN'

Angelika Utecht, Montabaur, Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Jun. 1, 1999, Appl. No. 323,470

Int. Cl. A01H *5/00*

U.S. Cl. Plt.—327 1 Claim

1. A new and distinct cultivar of geranium plant named 'Fishelen', as described and illustrated.

US PP12,728 P2

FICUS PLANT NAMED 'MINI MIDNIGHT'

Jan van Geest, S'Gravenzande, Netherlands, assignor to Plantenwekerij J. Van Geest, B.V., JP S'Gravenzande, Netherlands

Filed Sep. 13, 2000, Appl. No. 661,158

Int. Cl. A01H *5/00*

U.S. Cl. Plt.—211 1 Claim

1. A new and distinct plant as herein described and illustrated.

US PP12,729 P2

GERANIUM PLANT NAMED 'AMRI WHITE SPLA II'

Mitchell Eugene Hanes, Morgan Hill, Calif., assignor to Goldsmith Plants, Inc., Gilroy, Calif.

Filed Mar. 12, 2001, Appl. No. 802,871

Int. Cl. A01H *5/00*

U.S. Cl. Plt.—325 1 Claim

1. A new and distinct cultivar of geranium plant as shown and described herein.

US PP12,730 P2

HIBISCUS PLANT NAMED 'GABRIEL'

Robert J. Dupont, Sr., Plaquemine, La., assignor to Dupont Nursery, Inc., Plaquemine, La.

Filed Jan. 18, 2001, Appl. No. 761,476

Int. Cl. A01H *5/00*

U.S. Cl. Plt.—257 1 Claim

1. A new and distinct Hibiscus plant named 'Gabriel', as illustrated and described.

US PP12,731 P2

POINSETTIA PLANT NAMED 'ECKAYANA'

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Encinitas, Calif.

Filed Feb. 9, 2001, Appl. No. 779,346

Int. Cl. A01H *5/00*

U.S. Cl. Plt.—303 1 Claim

1. A new and distinct cultivar of Poinsettia plant named 'Eckayana', as illustrated and described.

US PP12,732 P2

HIBISCUS PLANT NAMED 'EVANGELINE'

Robert J. Dupont, Sr., Plaquemine, La., assignor to DuPont Nursery, Inc., Plaquemine, La.

Filed Jan. 18, 2001, Appl. No. 761,475

Int. Cl. A01H *5/00*

U.S. Cl. Plt.—257 1 Claim

1. A new and distinct Hibiscus plant named 'Evangeline', as illustrated and described.

US PP12,733 P2

LILY PLANT NAMED 'MEDUSA'

Cees A. van der Voort, Katwijk, Netherlands, assignor to Vletter & Den Haan Beheer B.V., Rijnsburg, Netherlands

Filed Jul. 19, 1999, Appl. No. 357,102

Int. Cl. A01H *5/00*

U.S. Cl. Plt.—315 1 Claim

1. A new and distinct cultivar of Lily plant named 'Medusa', as illustrated and described herein.

US PP12,734 P2

CHRYSANTHEMUM PLANT NAMED 'FICTION'

Cornelis P. Vandenberg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 11, 2001, Appl. No. 757,512

Int. Cl. A01H *5/00*

U.S. Cl. Plt.—286 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named 'Fiction', as illustrated and described.

US PP12,735 P2

BEAUCARNEA PLANT NAMED 'FACH9901BEAU'

Cornelis Johannes Janssen, Harteveldlaan 10, 2675 LE Honselersdijk, Netherlands

Filed Mar. 1, 2001, Appl. No. 797,252

Int. Cl. A01H *5/00*

U.S. Cl. Plt.—373 1 Claim

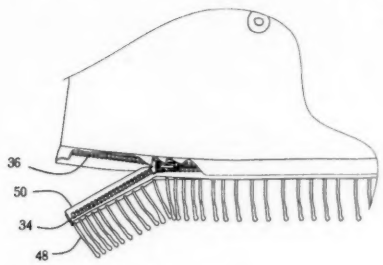
1. A new and distinct cultivar of Beaucarnea plant named 'FACH9901BEAU' as illustrated and described.

PATENTS

GRANTED JUNE 25, 2002

GENERAL AND MECHANICAL

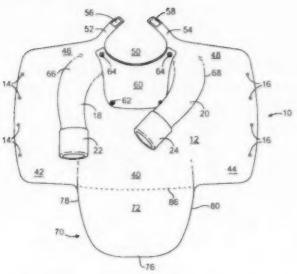
US 6,408,438 B1
ADJUSTABLE LENGTH GARMENT
Dale D. Mc Kee, 2071 Royal Fern La., Hoover, Ala. 35244
Filed Mar. 30, 2001, Appl. No. 822,139
Int. Cl. A41D *27/08*
U.S. Cl. 2—69 **3 Claims**



1. An extendable garment apparatus comprising:
a main covering, said main covering having a bottom edge;
a plurality of braids, each of said braids having a top edge having a coupling member therein for selectively coupling one of said braids to said bottom edge;
a plurality of panels, each of said panels being generally tubular shaped and having a first edge and a second edge;
a plurality of connectors for selectively connecting each of said first edges to said bottom edge of said main covering, said second edge of said panels or along a length of said braids, wherein a first of said panels is coupled to said bottom edge of said main body and a plurality of panels being coupled to each other and to said first panel to extend a length of the garment; and
each of said connectors traversing around each of said first edges, second edges and bottom edge, each of said connectors comprising a first zipper portion and a second zipper portion, each of the first zipper portions being securely coupled to and extending along one of said first edges, and a length of said braids, each of said second zipper portions being securely coupled to and extending along one of said second edges and said bottom edge, each of said first zipper portions having a tab thereon for releasably joining the first zipper portion to one of said second zipper portions, each of said first zipper portions being securely attached to one of said first edges of said panels, wherein a first of said panels is coupled to said bottom edge of said main covering and a plurality of panels being coupled to each other and to said first panel to extend a length of the garment, a portion of said panels having a break therein extending between said first and second edges.

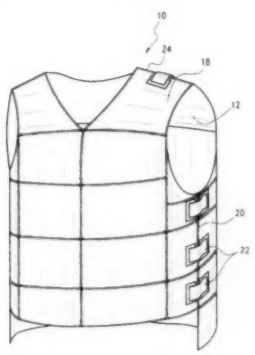
US 6,408,439 B1
GARMENT FOR USE IN A CHILD CAR SEAT
Julia R. Garforth-Crippen, 6096 Donna Jay Dr., Loveland, Ohio 45140-8431
Provisional application No. 60/205,391, filed on May 19, 2000. This application May 21, 2001, Appl. No. 863,206.
Int. Cl. A41D *11/00*
U.S. Cl. 2—80 **19 Claims**

1. A garment for covering a user, said garment comprising:
an upper portion sized and configured to cover a front of a torso of the user, said upper portion including:
a front panel,
a right side extension extending from a right side of said front panel,
a left side extension extending from a left side of said front panel,



a right shoulder panel extending upward from said front panel and said right side extension,
a left shoulder panel extending upward from said front panel and said left side extension,
a right arm sleeve extending from said upper portion and located right of said front panel and below said right shoulder panel,
a left arm sleeve extending from said upper portion and located left of said front panel and below said left shoulder panel,
and a lower portion sized and configured to enclose the legs of the user, said lower portion extending downward from said upper portion, said lower portion attached to said upper portion such that a solid panel capable of entirely covering a torso and legs of the user from below the neck is formed,
wherein said garment is sized and configured to allow the user to don said garment when in a seated position and whereby the user may don said garment by placing said garment in front of the user and placing an arm in each of said sleeves, then wrapping said left and right side extensions to the right and left of the user and placing the legs of the user in said lower portion.

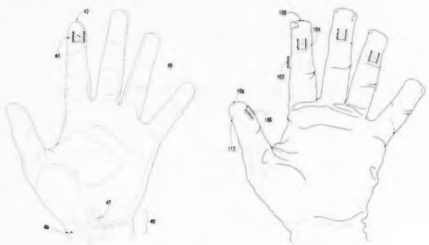
US 6,408,440 B1
PROTECTIVE VEST
Richard S. Phillips, 451 Constellation, No. 1309, League City, Tex. 77573
Filed May 24, 2000, Appl. No. 577,452
Int. Cl. A41D *13/00*
U.S. Cl. 2—102 **14 Claims**



1. A protective vest for a user comprising a fabric backer configured to cover the user's torso and a plurality of protective plates fastened to the fabric backer so as to cover said fabric backer, wherein the protective plates each comprise a dimension-

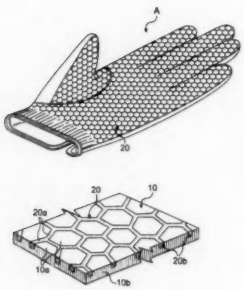
ally stable structural polymer foam layer sandwiched between two layers of tough plastic film.

US 6,408,441 B1
PROTECTIVE ANIMAL SKINNING GLOVE
Curtis R. Smith, Wellesley; James Lattari, Attleboro, both of Mass., and Troy Hughes, Americus, Ga., assignors to Whiting & Davis, Attleboro Falls, Mass.
Filed May 2, 2000, Appl. No. 562,527
Int. Cl. A41D *19/00*
U.S. Cl. 2—161.6 **27 Claims**



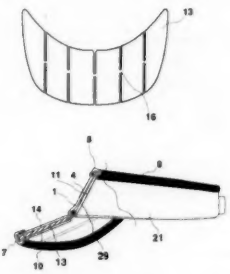
1. A protective animal skinning glove comprising:
at least one index finger made of metal mesh material; and
at least two gripping members protruding from the index finger for gripping the skin of the animal to reduce strain on the flexor retinaculum thereby.

US 6,408,442 B1
ATHLETIC GLOVE HAVING SILICONE-PRINTED SURFACE FOR CONSISTENT GRIPPING ABILITY IN VARIOUS MOISTURE CONDITIONS
Hye Sook Kang, c/o Hanyoung Kangaroo Co., Ltd, 610-11, Jung Kook-Dong, Kwang Jin-Gu, Seoul, 143-220, Rep. of Korea
Continuation of application No. 08/991,487, filed on Dec. 16, 1997, now Pat. No. 6,044,494, which is a continuation-in-part of application No. 08/780,068, filed on Dec. 23, 1996, now abandoned. This application Dec. 13, 1999, Appl. No. 459,610.
Claims priority, application Rep. of Korea, Jul. 14, 1997, 97-32642; Jul. 25, 1997, 97-34964
This patent is subject to a terminal disclaimer.
Int. Cl. A41D *19/00*
U.S. Cl. 2—167 **20 Claims**



1. A glove comprising:
a back part and a front part combined with the back part, to fit a hand, said front part comprised of a thin, soft and supple base fabric having an exterior contact area for gripping; and
a pattern comprised of a silicone sealant located on said base fabric to form a contact surface covering at least a portion of said exterior contact area for gripping, said silicone sealant penetrating into said base fabric to form a plurality of anchored channels.

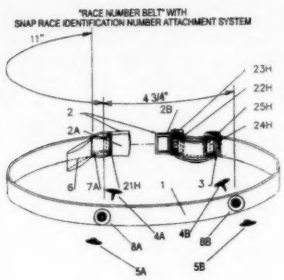
US 6,408,443 B1
REVERSIBLE VISOR
Boo Yl Park, Seoul, Rep. of Korea, assignor to Dada Corp., Seoul, Rep. of Korea
Filed Apr. 18, 2001, Appl. No. 836,328
Int. Cl. A42B *1/00*
U.S. Cl. 2—195.1 **17 Claims**



1. A reversible sun visor, comprising:
a loop-shaped main body comprised of an outer fabric material, an inner fabric material, an upper periphery and a lower periphery;
a thin and narrow fabric stitched along the upper periphery of said main body to cover unsightly tucks made by portions of the fabric materials joined together;
a cut visor attached to the lower periphery of said main body, said visor comprising a visor material having a fixed size and thickness for defining said cut visor, the visor material having inner and outer portions and being partially cut at predetermined intervals to leave an uncut portion to retain said visor material in one piece, and the inner and outer portions of said visor material being covered with fabric pieces of same size and being stitched with a thin and narrow fabric along an outer periphery of the visor material; and
a size adjustable portion for adjusting the size of the loop of the reversible sun visor and consisting a part of the loop-shaped main body.

US 6,408,444 B1
RACE NUMBER BELT WITH SNAP RACE IDENTIFICATION NUMBER ATTACHMENT SYSTEM
Leonard C. Zinna, 1651 So. Juniper St. #20, Escondido, Calif. 92025, assignor to Leonard C. Zinna, Escondido, Calif.
Provisional application No. 60/189,275, filed on Mar. 14, 2000. This application Mar. 14, 2001, Appl. No. 808,909.
Int. Cl. A41F *9/00*
U.S. Cl. 2—312 **1 Claim**

1. An elastic belt for attachment around a waist of a wearer comprised of an elongated elastic strip having two ends and a central portion wherein a male buckle component is attached at one end and a female buckle component is attached at the other end for attachment to said male buckle component a length adjustment slide device on said elastic belt for waist size adjustment and a race identification number attachment means attached to said central portion of said elastic belt and consisting of two sockets that are attached to said elastic belt using caps applied to a backside of said elastic belt while said sockets are applied to a front side of said elastic belt and are spaced as to accept various size identification signs placing identification number sign between said sockets and



mating studs to said sockets while crushing said identification sign material between mated said sockets and studs, by allowing said identification number sign to be securely but not permanently attached to said elastic belt.

US 6,408,445 B1

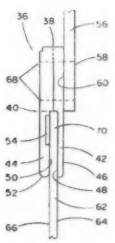
PANTY LEG ATTACHMENT DEVICE AND GARMENTS INCORPORATING SAME

Diane M. Matthews, East Bend, N.C., assignor to Sara Lee Corporation, N.C.

Continuation-in-part of application No. 08/676,677, filed on Jul. 10, 1996, now abandoned. This application Sep. 9, 1997, Appl. No. 926,132.

Int. Cl. A41B *9/04;11/04;* **A41F** *19/00;* **A41C** *1/00*

U.S. Cl. 2—406 **10 Claims**



1. A panty leg attachment device for securing an open end of a tubular leg covering garment having an inner and outer side and an elastic top band to a leg opening of a panty garment having an inner side and an outer side, the device comprising: a panty inner band with first and second sides, the first inner band side bonded to the panty garment outer side; a panty outer band having first and second sides, the panty outer band first side having securing segments affixed thereto, the leg covering garment elastic top band having a first and second side, the elastic top band first side engaging the inner band second side and the elastic top second side having a plush covering releasably securable to the outer band side supported securing segments to hold the leg covering garment in a substantially fixed and concealed relationship with the panty garment while the panty and leg covering garments are being worn wherein the securing segments carry microfine hook fasteners that minimize damage to the leg covering garment.

US 6,408,446 B1

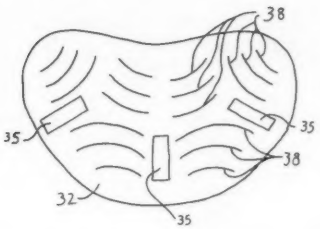
PROTECTIVE GARMENT FOR THE HIP AREA

Janice Carrington, Valley Forge, Pa., assignor to Plum Enterprises, Inc., Valley Forge, Pa.

Filed Mar. 29, 2000, Appl. No. 538,353

Int. Cl. A41D *13/00*

U.S. Cl. 2—465 **21 Claims**



19. A protective garment to be worn by a person to absorb shock and protect selected regions of the body against the shock, the garment comprising:

a plurality of protective areas for protecting the enarthrodial joint regions of the wearer against shock, the protective areas located to cover the enarthrodial joint regions of the hips of the wearer, the protective areas extending upwards as far as the hip-bone and extending horizontally to cover at least one quarter of the circumference of the wearer; and

a nonprotective area for providing structural integrity to the garment and for securing the protective areas adjacent the enarthrodial regions of the wearer;

each protective area comprising a resilient pad, each pad having a plurality of slits therein for increasing the flexibility of the pad and conformity of the pad to the enarthrodial regions of the wearer;

the slits in each pad being placed so as to form a central slit-free area over the enarthrodial joint, first and second groups of slits extending outwards and upwards in an upper part of said pad on either side of said central area, third and fourth groups of slits extending outwards in a lower part of said pad on either side of said central area, and fifth and sixth groups of slits extending outwards and downwards in a part of said pad outside said first and second groups of slits.

US 6,408,447 B1

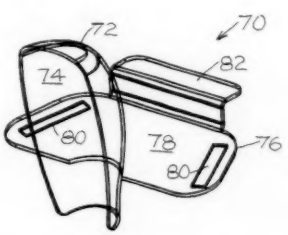
ADULT URINE SPLASH GUARD

Roderick S. Burbank, 19310 Marlowe, Detroit, Mich. 48235, and Tim Hill, 28250 Santa Barbara, Lathrup Village, Mich. 48076

Provisional application No. 60/122,641, filed on Mar. 3, 1999. This application Mar. 3, 2000, Appl. No. 518,315.

Int. Cl. E03D *9/00*

U.S. Cl. 4—300.3 **19 Claims**



1. A urine deflector for detachable interconnection with a toilet seat having an upper surface configured to support a user and a hole defined through the seat, said deflector comprising:

a one piece stream deflection member for deflecting a stream of urine into a toilet bowl, said deflection member having an upper edge and a lower edge and a concave deflection surface extending therebetween, the deflection surface being horizontally and vertically concave, and smoothly curved between the upper and lower edges without any discontinuity;

a support member extending from said deflection member, said member having a generally planar body configured to be supported on the upper surface of the seat, said body supporting said deflection member such that when said body is disposed on the upper surface said deflection member projects through the hole in the seat with the lower edge disposed below the surface of the seat and the concave deflection surface faces a user seated on the seat;

said support member further comprising attachment means for releasably retaining said generally planar body in engagement with the upper surface of the seat.

US 6,408,448 B1

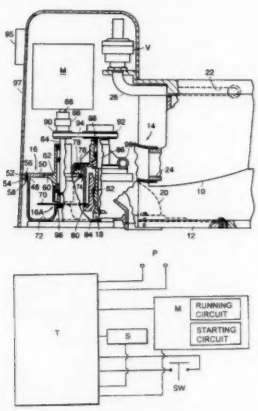
WATER SAVING TOILET SYSTEM CONTROLLER

Donald A. Jermier, Stamford, Conn., assignor to Control Fluidics, Inc., Staten Island, N.Y.

Filed Apr. 18, 2000, Appl. No. 551,270

Int. Cl. E03D *9/10*

U.S. Cl. 4—319 **6 Claims**



1. A toilet system controller comprising, in combination:

a toilet bowl having at a bottom thereof a discharge opening;

a treating chamber having an intake opening, the intake opening being connected to the discharge opening of the bowl;

a macerator located in the treating chamber;

a discharge pump located in the treating chamber for discharging treated effluent to a waste pipe;

a motor having a starting circuit and a running circuit and operably connected to the macerator and discharge pump for effecting simultaneous operation of the macerator and discharge pump;

a valve connecting the toilet bowl to a source of water and operable to admit water to the bowl to flush the bowl; and

a timer to regulate operation of the motor and the valve during a flushing cycle, wherein the flushing cycle is initiated by operation of the motor starting at time zero and continuing for five seconds thereafter, followed by opening of the valve starting at time zero plus one and one half seconds and continuing for six and one half seconds; wherein power is directed to the starting circuit starting at time zero and continuing for five hundred milli seconds, followed by power being directed to the running circuit for the remainder of the five seconds during which the motor is running.

US 6,408,449 B1

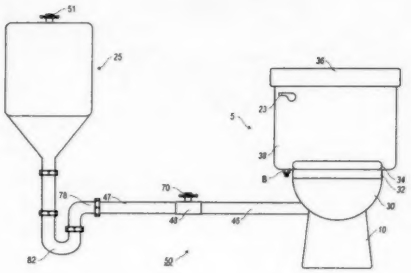
URINAL ATTACHMENT TO A COMMODE

David Aguirre, 1004 Ave. I, Brownwood, Tex. 76801

Filed Apr. 9, 2001, Appl. No. 829,143

Int. Cl. E03D *13/00*

U.S. Cl. 4—342 **16 Claims**



1. A toilet assembly in combination with a urinal comprising:

a commode having a bowl being in communication with a water tank and being supported by a base;

a flushing mechanism attached to said water tank;

said base having a peripheral wall and a passageway located inside said wall;

a nipple being projected through said wall of said base; and

said nipple connecting said urinal to said commode utilizing a valve connection.

US 6,408,450 B2

DECORATIVE VASE AND TOILET COVER

John J. Giaimis, 753 Mill St., Apartment 14, Belleville, N.J. 07109

Provisional application No. 60/203,523, filed on May 11, 2000. This application May 10, 2001, Appl. No. 852,092.

Int. Cl. E03D *1/00*

U.S. Cl. 4—353 **5 Claims**

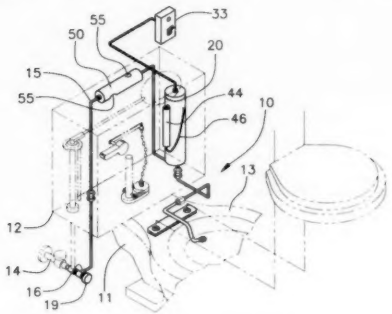
1. A decorative vase and toilet cover that is set on top of an existing toilet commode, comprising:

a toilet cover that has a raised aperture, forming a top part of a vase;

a perforated basket that is set underneath the raised aperture forming a bottom part of a vase, said basket having a plurality of holes designed to hold the bottom of a set of flowers; and

an attaching means for attaching the perforated basket underneath the raised aperture.

US 6,408,451 B1
BIDET APPARATUS
Wayne J. Carn, and Russell J. Sawford, both of 103 Norrie Avenue, Whyalla Norrie 5608, Australia
Filed Apr. 27, 2001, Appl. No. 844,771
Int. Cl. E03D *11/02*
U.S. Cl. 4—420.2 **20 Claims**



1. A bidet apparatus for positioning in a toilet, the toilet having a tank portion and a bowl portion, a water supply pipe for supplying water to the toilet being fluidly coupled to said tank portion, said apparatus comprising:

an elongated pipe having a first end and a second end, said first end being fluidly coupled to said water supply pipe, said second end being positioned in said bowl portion such that said second end is directed relatively upwardly out of said bowl portion, a nozzle being attached to said second end of said elongated pipe;

an actuator valve for selectively opening and closing water flow to said elongated pipe, said actuator being attached to said water supply pipe and comprising a valve;

a heating device for heating water flowing through said elongated pipe, said heating device being in fluid communication with said elongated pipe and being positioned between said first and second ends of said elongated pipe;

said heating device comprising:

a housing having a bottom wall, a top wall and peripheral wall extending between said top and bottom walls, said top wall being threadably coupled to said peripheral wall;

said heating device comprising an inlet portion of said elongated pipe extending into said housing through said bottom wall;

an outlet portion of said elongate pipe extending into said housing through said bottom wall;

a heating element being positioned in said housing, said heating element being attached to said top wall and extending toward said bottom wall;

a power supply being operationally coupled to said heating element;

a thermostat for regulating water temperature within said housing;

said thermostat comprising:

a capsule being positioned in said housing and located nearer said top wall than said bottom wall;

a sleeve being fluidly coupled to said capsule and extending upwardly through said top wall;

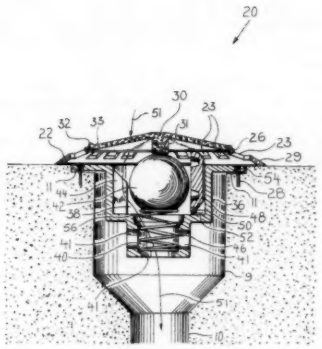
a rod being slidably positioned in said sleeve and having annular rim thereon for forming a seal between said rod and said sleeve;

a thermally reactive oil being positioned in said capsule such that said oil expands when heated, wherein said rod is extended upwardly through said sleeve;

an actuator being coupled to an outer surface of said top wall by a resiliently flexible bracket, said flexible bracket biasing said actuator toward said top wall and said rod, said actuator having a protruding member attached thereto, a screw being threadably engaged to and extending through said protruding member for selectively positioning said actuator nearer or further away from said top wall; and

wherein said heating element is turned off when said rod engages said actuator.

US 6,408,452 B1
AUTOMATIC SHUT-OFF VALVE
Arthur J. Bromley, 15432 SE. 103rd Street Rd., Oklawaha, Fla. 32179
Continuation-in-part of application No. 09/593,939, filed on Jun. 15, 2000, now Pat. No. 6,295,661, Provisional application No. 60/198,779, filed on Apr. 21, 2000. This application Aug. 22, 2001, Appl. No. 934,397.
Int. Cl. E04H *4/06*
U.S. Cl. 4—504 **18 Claims**



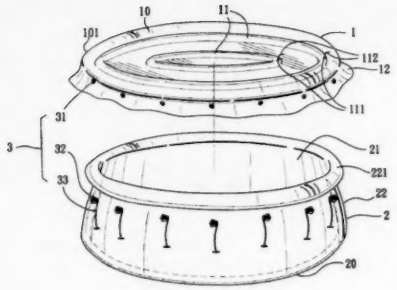
1. An automatic shut-off valve comprising a ball and a ball spring disposed between a diaphragm and a housing, said diaphragm being made of resilient material, a diaphragm base attached to said diaphragm around an outer edge of said diaphragm, said diaphragm base comprising a plurality of diaphragm base apertures, said diaphragm base being attached to said housing, said housing comprising a housing ball chamber communicating with a housing spring chamber through a valve seat, said ball being sized to sealably seat in said valve seat when said automatic shut-off valve is in a closed position, said ball being disposed substantially within said ball chamber, said ball spring being disposed substantially within said spring chamber, said ball spring urging said ball out of contact with said valve seat, said housing further comprising at least one housing spring chamber aperture through which said spring chamber communicates with an exterior of said housing spring chamber.

US 6,408,453 B1
INFLATABLE SWIMMING POOL ASSEMBLY
Rong-Jyh Song, and Tsung-Ping Yen, both of Taipei, Taiwan, assignors to Aqua-Marine International Inc., Taipei, Taiwan
Filed May 25, 2001, Appl. No. 865,789
Int. Cl. E04H *4/00;4/10*
U.S. Cl. 4—506 **5 Claims**

1. An inflatable swimming pool assembly comprising:

an inflatable swimming pool having a bottom base, and a surrounding wall extending upwardly from a periphery of said bottom base to confine an accommodation space, and terminating at an upper surrounding edge portion which defines an opening for access into said accommodation space;

a flexible cover having an upper major wall with a first peripheral edge portion and of such a dimension as to permit said first peripheral edge portion to rest on said upper surrounding

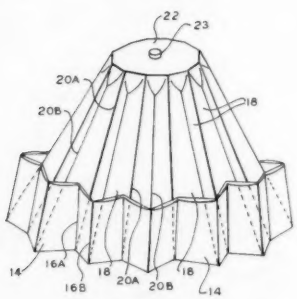


edge portion to cover said opening when said flexible cover is stretched, and a flap portion extending from said first peripheral edge portion such that said flap portion is suspended from said first peripheral edge portion and is to be pulled over to be disposed beyond, and outwardly and downwardly of said upper surrounding edge portion when said flexible cover is stretched;

inner and outer annular flexible sheet members respectively having second and third peripheral edge portions which are inner and outer annular flexible sheet members, said inner annular flexible sheet member having second peripheral edge portions, said outer annular flexible sheet member having third peripheral edge portions, said second and third peripheral edge portions being in sealing attachment to said upper major wall to confine respectively first and second annular inflatable spaces such that when said first and second annular inflatable spaces are inflated, said flexible cover is stretched, said second and third peripheral edge portions being disposed concentrically with each other; and

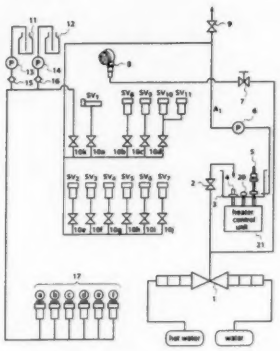
first and second inflating valves disposed respectively to inflate or deflate said first and second annular inflatable spaces.

US 6,408,454 B1
FOLDING WADING POOL AND METHOD FOR FOLDING A POOL
Earl Hyde, P.O. Box 56, New Vernon, N.J. 07976
Filed Jul. 13, 2001, Appl. No. 902,891
Int. Cl. E04H *4/00*
U.S. Cl. 4—506 **29 Claims**



1. A folding wading pool having in an unfolded condition a floor encompassed by an annular sidewall, said floor having a plurality of lower creases diverging outwardly from a central location toward said sidewall, said sidewall having a spaced plurality of upright creases, said lower and said upright creases being foldable to: (a) contract said sidewall by folding said upright creases, and (b) collapse said floor by (i) articulating said lower creases about said central location, and (ii) swinging said sidewall toward said floor.

US 6,408,455 B2
AUTOMATIC HAIR WASHER
Hirohisa Shimizu, Osaka, Japan, assignor to Oohiro Works, Ltd., Osaka, Japan
Filed Aug. 20, 1999, Appl. No. 377,931
Claims priority, application Japan, Nov. 10, 1998, 10-319325
Int. Cl. A45D *19/02*
U.S. Cl. 4—518 **1 Claim**



1. An automatic hair washer which performs hair washing by supplying wash water in a hot water storing tank to washing nozzles, which wash water is previously adjusted so as to be a predetermined temperature at an appropriate temperature for hair washing and then supplied to the hot water storing tank, said automatic hair washer comprising:

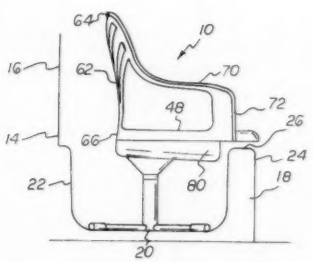
a temperature detecting means for measuring a temperature of the wash water, said temperature detecting means being positioned within said hot water storing tank,

a water amount detecting means for detecting an amount of the wash water in the hot water storing tank,

a heater for heating the wash water, said heater being positioned within said hot water storing tank, and

a heater control means for controlling the heater, wherein said heater control means operates to heat the wash water in the hot water storing tank to a predetermined temperature when the temperature of the wash water is below the predetermined temperature and the amount of the wash water in the hot water storing tank is more than a minimum amount.

US 6,408,456 B1
SWIVEL TUB AND SHOWER CHAIR SYSTEM
Kathleen A. Fike, and Gilmour J. Fike, both of 3120 Property La., Valrico, Fla. 33594
Filed Aug. 7, 2001, Appl. No. 923,905
Int. Cl. A47K *3/12*
U.S. Cl. 4—560.1 **6 Claims**



1. A swivel tub and shower chair system comprising:

a base assembly having a pedestal in a hollow cylindrical configuration with an upper and lower end and with a plurality of radially positioned stabilizing legs having interior ends rigidly coupled to the lower end of the pedestal;

a chair assembly having a seat with an access aperture and with an imperforate floor there beneath, and with a pair of vertical side extensions coupling the floor and the seat thereby forming a front opening and a rear opening, the floor further having a lower post extending downwardly therefrom and being adapted to be received in the upper end of the pedestal of the base assembly, the chair being offset forwardly from the center of the base assembly.

US 6,408,457 B1

BATHROOM UNIT

Silvia Bader, c/o Magenta Marketing GmbH Poatfach 701307, D-81313 Munich, Germany

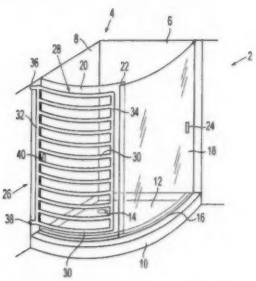
PCT No. PCT/DE99/03294, § 371 Date May 17, 2001, § 102(e) Date May 17, 2001, PCT Pub. No. WO00/21423, PCT Pub. Date Apr. 20, 2000

PCT Filed Sep. 30, 1999, Appl. No. 807,379

Claims priority, application Germany, Oct. 12, 1998, 198 46 941

Int. Cl. A47K *3/24;10/06*

U.S. Cl. 4—598 **10 Claims**



1. A bathroom unit, comprising a shower tub and a shower unit wall substantially defining a showering area and provided with a first door, whereby a heating device extends at least along a partial section of the shower unit wall, characterized in that said shower unit wall comprises a second door in the region of said heating device, said second door opening to allow access to the showering area and to directly expose said heating device to the showering area.

US 6,408,458 B1

SHOWER CURTAIN SPLASH ACCESSORY

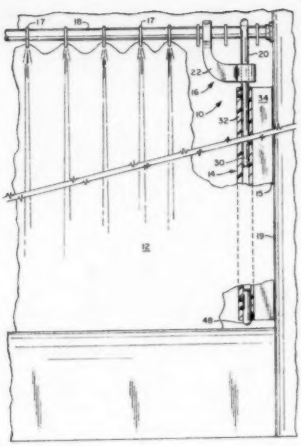
Ralph H. Chilton, 108 N. Cove Dr., Ponte Vedra Beach, Fla. 32082

Continuation-in-part of application No. 09/413,952, filed on Oct. 7, 1999, now Pat. No. 6,195,817. This application Sep. 28, 2000, Appl. No. 670,802.

Int. Cl. A47K *3/00*

U.S. Cl. 4—609 **17 Claims**

1. A splash accessory for a shower curtain suspended from a curtain rod within a shower curtain opening, the curtain being shiftable on the curtain rod to position a leading edge section of curtain next to an opposed shower wall at one end of the shower curtain opening; the splash accessory comprising an elongated edge member, and hangar means for hanging the splash accessory from the curtain rod with the edge member suspended in a generally upright position from the curtain rod at a forward position next to the shower wall; the improvement wherein the hangar means comprises an elongated hangar rod with an upper hook for hanging the splash accessory from the curtain rod and a lower depending



support rod, wherein the edge member has a hub mounted on the depending rod and has a forward, longitudinally extending, generally imperforate, splash shield flap extending laterally outwardly from the hub and extending laterally, forwardly and inwardly, at an angle of between 30 to 90 degrees from the vertical plane of the curtain rod, and therefore inwardly of and across the end of the curtain opening when the edge member is next to the opposed shower wall.

US 6,408,459 B1

TOILET BOWL EQUIPPED WITH FAR INFRARED LAMPS

Kum-Hoon Lee, 651-403 Shinnamushil Miju APT, 965-2 Youngtong-dong, Paldal-gu, Suwon-si, Kyoungki-do, 442-730, Rep. of Korea

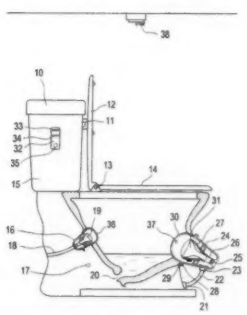
PCT No. PCT/KR00/00521, § 371 Date Jan. 19, 2001, § 102(e) Date Jan. 19, 2001, PCT Pub. No. WO01/75239, PCT Pub. Date Oct. 11, 2001

PCT Filed May 24, 2000, Appl. No. 744,319

Claims priority, application Rep. of Korea, Apr. 1, 2000, 2000-9359

Int. Cl. A47K *13/00*

U.S. Cl. 4—661 **3 Claims**



1. A toilet bowl equipped with far infrared lamps, comprising:

front and rear holes, which are formed at a lower portion of a toilet bowl body;

first and second far infrared lamps respectively inserted into the front and rear holes for emitting far infrared rays, wherein the front and rear holes are formed in appropriate positions for making the far infrared lamps emit the far infrared rays to the

genital organs and the anus region of women and men when a user sits down on a toilet bowl seat;

first and second transparent heatproof lenses, each of which is disposed between the hole and the far infrared lamp;

a sensing means to be mounted on a ceiling for detecting the user and providing automatic operation of the far infrared lamps;

a sensor switch for activating the sensing means; and

an ON and OFF switch for manually operating the far infrared lamps.

US 6,408,460 B1

COLLECTOR OF UNUSED WATER

Dimitrios Naoum, 551 32 Kalamaria, Thessaloniki, Greece

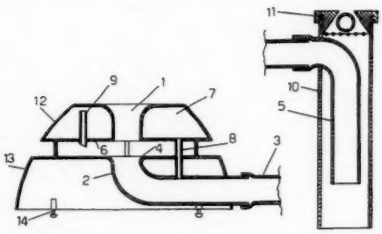
PCT No. PCT/GR99/00024, § 371 Date Jan. 8, 2001, § 102(e) Date Jan. 8, 2001, PCT Pub. No. WO00/03098, PCT Pub. Date Jan. 20, 2000

PCT Filed Jul. 5, 1999, Appl. No. 743,291

Claims priority, application Greece, Jul. 9, 1998, 980100268

Int. Cl. A47K *4/00*

U.S. Cl. 4—665 **6 Claims**



1. A collector of unused water comprising: a head and a remaining part; the head comprising small and large sections; the small section constituting the upper part of the head of the collector and comprising a regulator for incoming water and having in its center a through hole having lips which are curved at the top, a water tank having an inlet during the filling and an outlet with overflow for the filling of an inlet pipe with water, and a water disturbance absorber; the large section constituting the base of the head of the collector and carrying anti-skid legs, an open-turn pipe having upper lips which are slightly curved, and a small cross-section pipe connecting the open-turn pipe to the water tank; and the remaining part comprising a flexible pipe connecting the head to a drain, the drain comprising a pipe inside of which extends an open-turn elbow with an extension along the run of the pipe and a side inlet, and an overflow valve in the upper part of the drain, the drain being connected, with or without a flexible pipe, to a water storage tank.

US 6,408,461 B2

COLLAPSIBLE ASSEMBLY

Yu Zheng, Covina, Calif., assignor to Patent Category Corp., Walnut, Calif.

Continuation of application No. 09/121,632, filed on Jul. 23, 1998, now Pat. No. 6,073,283. This application Apr. 21, 2000, Appl. No. 553,651.

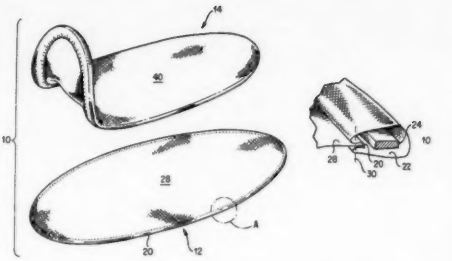
This patent is subject to a terminal disclaimer.

Int. Cl. A47G *9/06*

U.S. Cl. 5—417 **20 Claims**

20. An assembly, comprising:

a panel comprising a flexible sheet material having a central portion, a peripheral edge and a pocket formed along the peripheral edge surrounding, but not within, the central portion, the panel further including a foldable frame member disposed in the pocket, the frame member having a folded and



an unfolded orientation providing the panel with a corresponding folded and unfolded orientation;

a covering removably securable to the panel;

wherein the covering overlies the central portion of the panel; and

wherein the pocket is annular.

US 6,408,462 B1

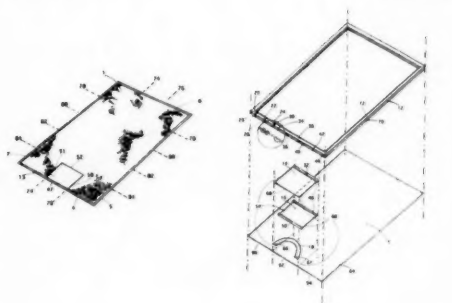
MULTI-PURPOSE BLANKET AND METHOD

Amanda Moore, 58-A Loma Blanca, Sante Fe, N. Mex. 87501

Filed May 15, 2001, Appl. No. 855,795

Int. Cl. A47G *9/06*

U.S. Cl. 5—417 **18 Claims**



1. A multipurpose device for use as a cushion, a hooded poncho, and a blanket comprising:

A pliable sheet, configurable for use as a blanket, having a top side and a bottom side and a first straight edge wherein the first straight edge is lengthwise dividable into three sections, a first one-third section, a second one-third section having a middle and a third one-third section, wherein a first boundary is formed by the first one-third section, and the second one-third section and a second boundary is formed by the second one-third section and the third one-third section;

A first attachment comprising at least a bi-layer of material having a first outside layer and a second outside layer; and comprising, in order, a first pocket edge substantially equal to the second one-third section of the pliable sheet, a second pocket edge, a third pocket edge and a fourth pocket edge;

wherein the first outside layer and second outside layer are fastened along the second pocket edge, the third pocket edge and the fourth pocket edge forming a first pocket;

and wherein the first pocket edge of the first outside layer is correspondingly fastened to the second one-third section of the at least one straight edge on the top side of the pliable sheet and the second pocket edge and the fourth pocket edge are fastened to the top side of the pliable sheet forming a second pocket; and,

At least one hood securing device attached to the first outside layer of the first attachment, substantially near the third edge and couplable to at least one center securing device located

substantially near the first straight edge and substantially near the middle of the second one third section,

wherein the multipurpose device can be alternately configured for use as the cushion or the hooded poncho.

US 6,408,463 B1

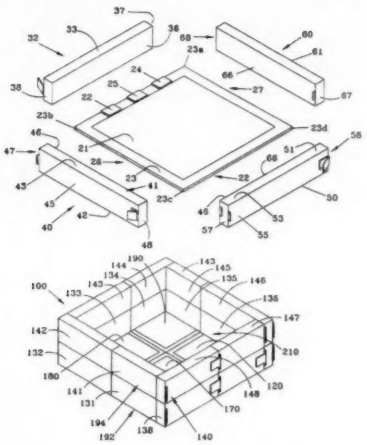
BABY PLAY MAT WITH PROTECTIVE ENCLOSURE

Andrea Palacio, 19411 Hanby Creek Ct., Houston, Tex. 77094

Filed Sep. 19, 2000, Appl. No. 665,135

Int. Cl. A47D *13/06*

U.S. Cl. 5—424 **15 Claims**



1. A baby play mat with a protective enclosure comprising:

a mat having an upper surface, a lower surface and a perimeter, the upper surface of the mat comprising fastening means adjacent the perimeter;

one or more bumpers circumscribing the perimeter, the bumpers comprising a top surface and a bottom surface, the top surface comprising a top fastening means and the bottom surface comprising a bottom fastening means,

the bumpers fixedly attached to the mat by connecting the fastening means of the mat to the bottom fastening means of the bumper to form a protective tier circumscribing the perimeter, the protective tier defining an interior cavity above the upper surface of the mat,

one or more additional bumpers comprising a second top fastening means and a second bottom fastening means, are fixedly layered upon the protective tier to form a second protective tier.

US 6,408,464 B1

BIRTHING BED FOOT SECTION ATTACHMENT MECHANISM

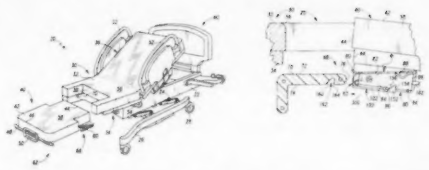
Matthew W. Weismiller, and Peter M. Wukusick, both of Batesville, Ind., assignors to Hill-Rom Services, Inc., Wilmington, Del.

Filed Aug. 23, 1999, Appl. No. 379,446

Int. Cl. A61G *7/015*

U.S. Cl. 5—602 **12 Claims**

1. A patient support apparatus including a main frame, a patient support coupled to the main frame, a removable section configured for insertion into the patient support, an attachment mechanism for attaching the removable section to the patient support such that the removable section is not aligned with the patient support until the removable section is fully inserted into the patient support and latched thereto, and such that the removable section is aligned with



the patient support only when the removable section is fully inserted into the patient support and latched to the patient support, the attachment mechanism comprising:

a guide member coupled to the main frame, the guide member including a first upwardly-facing surface portion on an upper side thereof and a second downwardly-facing surface portion on an underside thereof, both surface portions extending generally parallel to an upwardly-facing surface of the patient support,

a guide track coupled to the removable section, the guide track including a first downwardly-facing surface portion on an upper side thereof extending generally at an angle with an upwardly-facing surface of the removable section and a second upwardly-facing surface portion on a lower side thereof extending generally parallel to the upwardly-facing surface of the removable section so as to form a diverging guide channel into which the guide member extends when the removable section is inserted into the patient support, the first generally-inclined, downwardly-facing surface portion of the guide track including a ramp portion near its diverging inner end adapted for engaging the guide member coupled to the main frame as the removable section inserted into the patient support (a) to cause the first generally-inclined, downwardly-facing surface portion of the guide track lo move away from the first generally-parallel, upwardly-facing surface portion of the guide member, and (b) to cause the second generally-parallel, upwardly-facing surface portion of the guide track to move closer to the second generally-parallel, downwardly-facing surface portion of the guide member to, in turn, cause the upwardly-facing surface of the removable section to align with the upwardly-facing surface of the patient support, and

a removable section locking mechanism coupled to the removable section for latching the removable section to the patient support when the removable section is fully inserted into the patient support and the upwardly-facing surface of the removable section is aligned with the upwardly-facing surface of the patient support.

US 6,408,465 B1

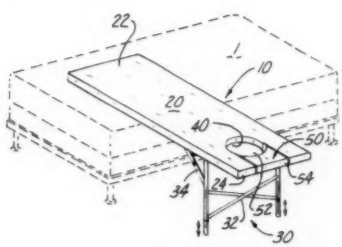
PORTABLE MASSAGE TABLE

Robert J. Fleming, 2422 Swifton Ct., Las Vegas, Nev. 89104

Filed Oct. 31, 2000, Appl. No. 702,970

Int. Cl. A47B *7/00*

U.S. Cl. 5—620 **7 Claims**



1. A massage table, comprising:

a planar base having a top surface, a bottom surface, a first end, and a second end having a centrally located concave first notch therein;

a planar extension slidably attached to the second end of the base, the extension having a top surface, a bottom surface, a first end having a centrally located concave second notch therein disposed in alignment with the first notch in the base, and a second end, the extension being movable between a first position wherein the second end of the base is aligned with the second end of the extension, and a second position wherein the second end of the base is spaced from the second end of the extension, whereby the first and second notches form a face opening of adjustable size;

wherein the first end of the base is disposed to be supported on a bed, and wherein legs attached to the bottom surface of the base are disposed to support the second end thereof; and

wherein the legs are movable between an extended position disposed perpendicular to the base, and a folded position disposed parallel to the base.

US 6,408,466 B1

STRETCHER FOR THE NON-TRAUMATIC TRANSPORT AND LIFTING OF PEOPLE

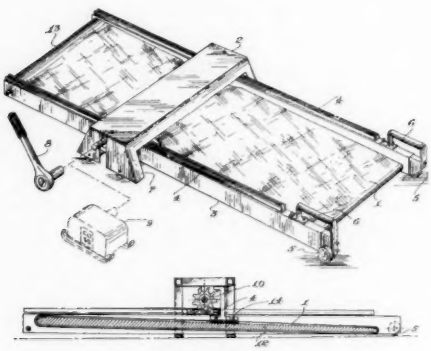
Claudio Artemio Blotta, Chacabuco 96, 2° piso, 1069 - Buenos Aires, Argentina

Filed Apr. 7, 2000, Appl. No. 544,784

Claims priority, application Argentina, Apr. 9, 1999, P 99 01 01622

Int. Cl. A61G *1/003*

U.S. Cl. 5—625 **7 Claims**



1. A stretcher that lifts the patient on to the stretcher from a plane surface and capable of being used to carry the patient to transportation, the stretcher comprising;

a frame having longitudinal beams with an inclined plate therebetween;

a flexible sheet positioned about the inclined plate, the flexible sheet having ends positioned in a lower position of said plate;

a bow-shaped base which surrounds the longitudinal beams of the frame, the bow-shaped base having legs that provide support;

a piece fixed to the base for joining each end of the flexible sheet at the lower position and allowing the flexible sheet to slide as the plate is moved along by the longitudinal beams;

a driving axle projecting through a side of the base; the driving axle having a coupling for receiving a means for rotating the axle; and

said longitudinal beams each having a superior edge with a toothed bar to receive dented wheels that are mounted onto the drive axle within the base, the means for rotating the drive axle is capable of causing the dented wheels to engage the toothed bars to move the base and in turn move the flexible sheet.

US 6,408,467 B2

ORTHOPEDIC HEAD AND NECK SUPPORT PILLOW THAT REQUIRES NO BREAK-IN PERIOD

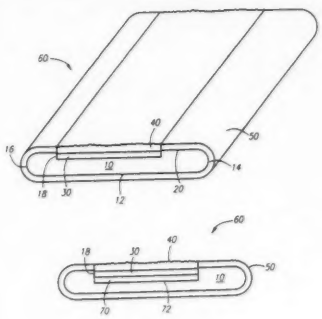
Lionel A. Walpin, 127 W. Hazel St., Inglewood, Calif. 90302

Continuation of application No. 09/496,834, filed on Feb. 2, 2000, now Pat. No. 6,182,312. This application Feb. 5, 2001, Appl. No. 778,018.

This patent is subject to a terminal disclaimer.

Int. Cl. A47G *9/14*

U.S. Cl. 5—636 **14 Claims**



1. A support device, comprising:

a core comprising a first and a second edge, a top surface, and a bottom surface;

a recess located on said top surface of said core;

a foam layer located within said recess; and

a C-shaped outer layer wrapped around said core, covering said first edge of said core, said bottom surface of said core, and said second edge of said core.

US 6,408,468 B1

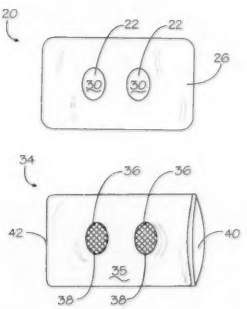
PILLOW TO FACILITATE HEARING

Kristen Comfort, 816 Placek Dr., Johnson City, N.Y. 13790

Filed Jul. 19, 2001, Appl. No. 907,865

Int. Cl. A47G *9/10*

U.S. Cl. 5—636 **5 Claims**



1. A pillow for permitting a reclining user to hear sounds, comprising an upper major surface and a lower major surface and having at least one hole extending through the entire thickness of said pillow, from said upper major surface to said lower major surface thereof wherein said at least one hole has dimensions large enough to receive a user's ear, and wherein said at least one hole is filled with sound transmitting material.

US 6,408,469 B2

BED CONSTRUCTION WITH REDUCED SAGGING

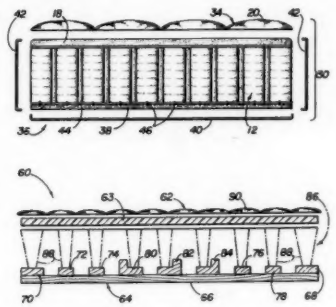
Rick F. Gladney, Fairburn; Kurtis Ling, and Douglass D. Kinde, both of Alpharetta, all of Ga., assignors to Simmons Company, Atlanta, Ga.

Continuation-in-part of application No. 09/482,591, filed on Jan. 13, 2000, now Pat. No. 6,243,900. This application Dec. 22, 2000, Appl. No. 742,126.

This patent is subject to a terminal disclaimer.

Int. Cl. A47C *27/05*

U.S. Cl. 5—720 **17 Claims**



1. A one-sided inner spring mattress assembly comprising:

a central core comprising a wire spring assembly having a lower border wire;

an upper padding layer extending over a top surface of the core and defining a sleeping surface; and

a lower rigid layer secured to the lower border wire and being disposed underlying and against the central core,

wherein the lower layer contacts and supports the central core to reduce permanent deflection from within the sleeping surface arising from compaction of a lower compressible layer by the wire spring assembly of the central core.

US 6,408,470 B1

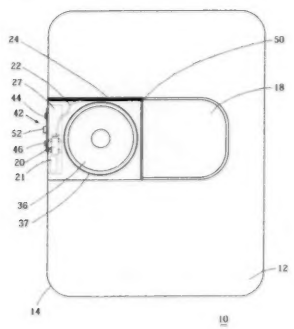
ADJUSTABLE MATERNITY MATTRESS

Robert Lee Powers, 4553 Windchime Cove, Memphis, Tenn. 38128

Filed Jan. 12, 2000, Appl. No. 481,700

Int. Cl. A47C *17/00*

U.S. Cl. 5—735 **5 Claims**



1. A maternity mattress comprising:

a mattress having a foam material enclosed by a mattress tick, said mattress tick having an upper surface, and said foam material having a cavity with a predetermined effective depth and width formed therein;

a sliding cover contained within said mattress immediately adjacent said upper surface of said mattress, said sliding cover movable between an open and closed position;

a plurality of individual foam members insertable into said cavity to adjust the effective depth of said cavity;

means for moving said sliding cover to adjust the effective width of the cavity, said sliding cover moving means also including means for preventing accidental or unintended movement of said sliding cover.

US 6,408,471 B1

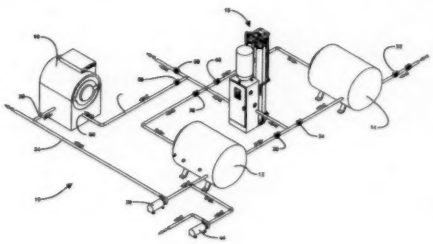
APPARATUS FOR TREATMENT OF LAUNDRY WITH OZONE

Alfredo J. Teran, Cape Canaveral; Richard G. Wood, Merritt Island; Nidal A. Samad, Merritt Island; Carlos V. Diaz, Merrit Island; Timothy N. Tyndall, Cape Canaveral, and John R. Derrick, Rockledge, all of Fla., assignors to Agrimond L.L.C., Cape Canaveral, Fla.

Division of application No. 09/394,314, filed on Sep. 10, 1999, Provisional application No. 60/100,002, filed on Sep. 11, 1998. This application Jul. 23, 2001, Appl. No. 682,112.

Int. Cl. D06F *39/08*

U.S. Cl. 8—158 **7 Claims**



1. An apparatus for treatment of laundry with ozone, said apparatus comprising:

a supply tank and a transfer tank, each of said tanks having a hollow interior and each of said tanks having a water inlet and a water outlet;

a water source connected in fluid communication with said tanks;

means for filling said supply tank and said transfer tank with water from said water source;

an ozone system for generating ozone and dissolving said ozone into water, said ozone system disposed between said water source and said supply tank in fluid communication with said supply tank wherein said ozone generated by said ozone system is introduced into a wash water flow to provide wash water having a dissolved ozone concentration to said supply tank;

a control means for controlling an amount of ozone generated by said ozone system;

a dissolved ozone concentration monitor disposed within said supply tank to determine the dissolved ozone concentration of the wash water;

an oxidation reduction potential monitor disposed within said transfer tank;

means for circulating water in said supply tank between said supply tank and said ozone system until said water in said supply tank has reached a predetermined dissolved ozone concentration;

means for circulating water in said transfer tank between said transfer tank and said ozone system until said water in said transfer tank has reached a predetermined oxidation reduction potential;

at least one washing means in fluid communication with said supply tank and said ozone system;

said at least one washing means including a plurality of wash water supply ports;

whereby wash water having a desired dissolved ozone concentration is delivered to said washing means.

7. A method for treatment of laundry with ozone, comprising the steps of:

providing a supply tank and a transfer tank in fluid communication with one another;

connecting a source of water to said supply tank and said transfer tank;

filling said supply tank and said transfer tank with water from said water source; providing an ozone generator for generating ozone and positioning said ozone generator between said water source and said supply tank in fluid communication with said supply tank so that ozone generated by said ozone generator is introduced into a wash water flow to provide wash water having a dissolved ozone concentration to said supply tank;

controlling an amount of ozone generated by said ozone generator;

monitoring a dissolved ozone concentration of water in said supply tank;

monitoring an oxidation reduction potential of water in said transfer tank;

circulating water in said supply tank between said supply tank and said ozone generator until said water in said supply tank has reached a predetermined dissolved ozone concentration;

circulating water in said transfer tank between said transfer tank and said ozone generator until said water in said transfer tank has reached a predetermined oxidation reduction potential;

connecting at least one washing means, having a plurality of wash water supply ports, in fluid communication with said supply tank and said ozone generator;

whereby wash water having a preselected dissolved ozone concentration and a preselected ozone oxidation potential is delivered to said washing means.

US 6,408,472 B1

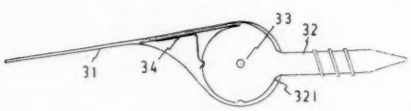
FIXING TOOL FOR HOLDING A MIDSOLE AND A SHOETREE

Hsi-Mou Huang, No. 5, Section 2, Lane 117, Fu-Tan Road, Ping-Chen City, Tao-Yuan Hsien, Taiwan

Filed Apr. 20, 2001, Appl. No. 839,628

Int. Cl. A43D *15/00*

U.S. Cl. 12—103 **1 Claim**



1. A fixing tool for holding a midsole and a shoetree, comprising a screw base and a screw body, the screw base formed as a hollow hob screw with both an inner thread and an outer thread, the screw body further including thereof a screw holder and a screw, the screw having a flat round top portion and periphery notches, and the top portion of the screw being clamped by the screw holder so as able to make a 90° rotation.

US 6,408,473 B1

TOOTH BRUSH WITH ELASTICALLY ARTICULATED REPLACEABLE HEAD

Kurt Kessler, Munich, Germany, assignor to SmithKline Beecham GmbH & Co. KG, Buehl, Germany

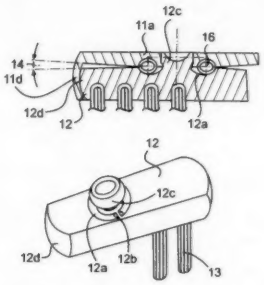
PCT No. PCT/EP97/01071, § 371 Date May 24, 1999, § 102(e) Date May 24, 1999, PCT Pub. No. WO97/32502, PCT Pub. Date Sep. 12, 1997

PCT Filed Mar. 4, 1997, Appl. No. 142,393

Claims priority, application Germany, Mar. 4, 1996, 196 08 226

Int. Cl. A46B *7/06;7/04*

U.S. Cl. 15—104.94 **20 Claims**



1. A toothbrush having a holder (**11**, **21**) and having a bristle part (**12**, **22**) and a ball joint (**12***c*, **22***c*) between and pivotally connecting the holder and bristle part, wherein the bristle part is pivotable through a pivot angle with respect to the holder by means of the ball joint (**12***c*, **22***c*) and wherein an elastic O-ring (**16**), which surrounds the ball joint (**12**, **22***c*) is provided between the holder and the bristle part with a cutout (**11***a*, **12***a*) shaped to correspond with said O-ring (**16**) and to receive said O-ring (**16**) being formed between the holder and the bristle part.

US 6,408,474 B1

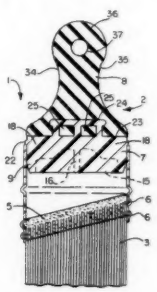
PAINT BRUSH WITH TWO COMPONENT BRUSH HANDLE AND METHOD OF MAKING SAME

John S. Husted, Dalton, and William P. Camp, Jr., Wooster, both of Ohio, assignors to The Wooster Brush Company, Wooster, Ohio

Filed Aug. 12, 1999, Appl. No. 373,463

Int. Cl. A46B *15/00;* **B25G** *1/00*

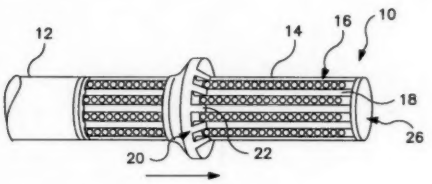
U.S. Cl. 15—143.1 **32 Claims**



1. A paint brush handle comprising a head portion made of a substantially rigid plastic material and a grip portion made of a flexible elastomeric material, said head portion having one end shaped to provide a close fit within a ferrule of a brush and an other end having an integral web portion protruding axially outwardly from said other end, said web portion having a thickness less than the thickness of said other end of said head portion, said

grip portion having an inner end molded around said web portion thereby securing said grip portion to said head portion, said grip portion extending axially outwardly of said web portion.

US 6,408,475 B1
SELF CLEANING BRUSH
Mark D. Morrison, 666 W. Endave, 193 Apt., New York, N.Y. 10025
Filed Sep. 13, 2000, Appl. No. 661,524
Int. Cl. A46B *17/06*
U.S. Cl. 15—159.1 **13 Claims**

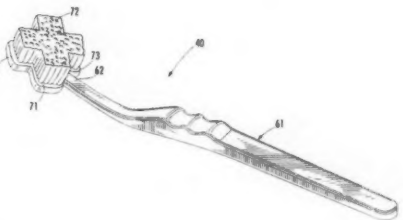


1. A self cleaning brush comprising:
a body having a plurality of bristles extending from at least a portion of said body;
a cleaning element slidably disposed on said body, said sliding element containing a plurality of projections which engage with said bristles;
said cleaning element projections further defining a space between said projections for said bristles to pass as said cleaning element slides along said body, wherein said space is of a size and geometry to engage said bristles and to clean said bristles as said cleaning element slides along said brush body.

US 6,408,476 B1
TOOTHBRUSH WITH ELASTOMER FILLED FLEXIBLE HEAD
David Victor Cann, Nr. Chertsey, United Kingdom, assignor to The Procter & Gamble Company, Cincinnati, Ohio
PCT No. PCT/US97/00968, § 371 Date Aug. 20, 1998, § 102(e) Date Aug. 20, 1998, PCT Pub. No. WO97/25899, PCT Pub. Date Jul. 24, 1997
PCT Filed Jan. 17, 1997, Appl. No. 101,918
Claims priority, application United Kingdom, Jan. 18, 1996, 9601012
Int. Cl. A46B *9/04*
U.S. Cl. 15—167.1 **21 Claims**

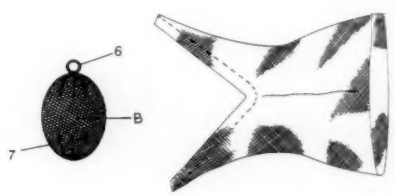
1. A toothbrush comprising:
i) an elongated handle having distal and proximal ends and at least one elastomeric handle region therein;
ii) a resiliently flexible head attached to the proximal end of the handle, the head including a pair of opposing faces, one of the pair being a bristle-bearing face with bristles attached to and extending from the face, wherein each of the opposing faces has a plurality of elastomer-containing transverse grooves extending completely through the head which divide the head into a plurality of segments; and
iii) at least one supply channel extending between the elastomeric handle region and each of the transverse grooves so that the elastomeric handle region and the transverse grooves can be filled with elastomer from a single injection point.

US 6,408,477 B1
ORTHODONTIC TOOTHBRUSH
Fay H. Culbreth, 4304 Park Rd., Charlotte, N.C. 28209
Filed Nov. 13, 2000, Appl. No. 711,434
Int. Cl. A46B *9/04*
U.S. Cl. 15—167.1 **7 Claims**



1. A toothbrush for cleansing the surfaces of the teeth and any orthodontic appliances positioned thereon, comprising:
(a) an elongate handle; and
(b) a head carried on one end of the handle and including first and second intersecting head members carrying cleaning elements thereon and defining at least three distinct and diverging head segments for providing an enlarged cleaning surface area sufficient to simultaneously engage the upper and lower teeth during brushing, wherein said first and second head members are positioned perpendicular to each other and are carried by the handle between the point at which any two of the head segments diverge.

US 6,408,478 B1
FOAM GENERATING NET FOR WASHING THE FACE
Izumi Kazumura, 16-5, Jingumae 6-Chome, Shibuya-ku, Tokyo, Japan
Filed Feb. 9, 1999, Appl. No. 247,079
Int. Cl. A47K *7/02*
U.S. Cl. 15—209.1 **7 Claims**



3. A foam-generating net for washing the face, wherein
an integrally molded plastic net of vertically and horizontally arranged fine mesh is formed into a globe having a diameter of 100 to 280 mm, and
a ring through which a finger may be inserted is attached to an arbitrary position of the globe.

US 6,408,479 B1

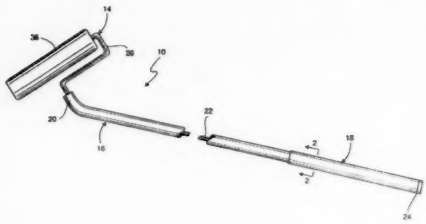
ARTICULATED PAINT ROLLER ASSEMBLY

Steve B. Pinney, 28053 Lakehurst Ave., Canyon Country, Calif. 91351

Provisional application No. 60/128,616, filed on Apr. 8, 1999. This application Apr. 7, 2000, Appl. No. 544,867.

Int. Cl. B05C *17/02*

U.S. Cl. 15—230.11 **34 Claims**



1. A paint roller assembly, comprising:

an elongated shaft;

an articulated paint application assembly disposed at one end of the shaft; and

an actuator connected to the articulated paint application assembly and extending through the shaft to a handle at an opposite end of the shaft, wherein rotation of the handle causes movement of the articulated paint application assembly;

wherein a portion of the shaft adjacent the articulated paint application assembly is angled.

US 6,408,480 B1

POLISHING DISK

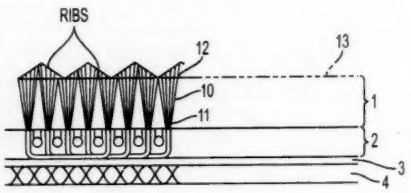
Martin Wiemann, Am Hendelberg 20, D-65375 Oestrich-Winkel, Germany

Filed Sep. 21, 1999, Appl. No. 400,741

Claims priority, application Germany, Sep. 21, 1998, 198 43 267

Int. Cl. A47L *11/02;11/164*

U.S. Cl. 15—230.12 **8 Claims**



1. A polishing disk for polishing surfaces, comprising:

a pile layer of fibers having free ends,

a holding layer for holding the fibers, and

a back side layer being entirely flat and determining a disk plane and having a sufficient stiffness for shape stability in the disk plane and sufficient flexibility to adapt to said surfaces to be polished;

said fibers being of a uniform thickness and shed-free and having a length in a range of two to ten millimeters and being anchored in said holding layer and extending transversely to said disk plane, such that the polishing disk is washable without losing said shape stability;

said back side layer being attached to said holding layer with waterproof adhesive and comprising hook and loop fastener means for being attached to a pad or plate.

US 6,408,481 B1

VACUUM CLEANER

James Dyson, Wiltshire, United Kingdom, assignor to Notetry Limited, Wiltshire, United Kingdom

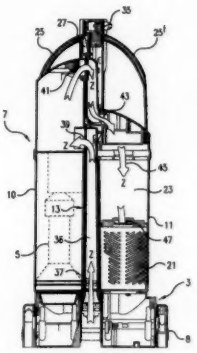
PCT No. PCT/GB98/03813, § 371 Date Aug. 21, 2000, § 102(e) Date Aug. 21, 2000, PCT Pub. No. WO99/30604, PCT Pub. Date Jun. 24, 1999

PCT Filed Dec. 17, 1998, Appl. No. 581,764

Claims priority, application United Kingdom, Dec. 17, 1997, 9726673

Int. Cl. A47L *5/28*

U.S. Cl. 15—350 **13 Claims**



1. A vacuum cleaner comprising:

a body and a cleaner head,

the body comprising a first casing, a second casing, a central spine and a handle,

the first casing housing a dust separation apparatus and the second casing housing at least one filter or other vacuum cleaner component, the first and second casings having longitudinal axes lying generally parallel to one another,

the central spine lying at least partly between the first and second casings and comprising at least one conduit and forming part of an airflow path within the vacuum cleaner, the conduit extending longitudinally from the cleaner head in the same direction as the central spine,

the handle extending upwardly from the body and configured to allow a user to maneuver the vacuum cleaner,

the cleaner head having wheels mounted thereon so as to allow the vacuum cleaner to be moved in a forward direction;

wherein the first and second casings are laterally spaced along a line substantially perpendicular to the forward direction.

US 6,408,482 B1

STANDARDIZED FURNITURE UNIT AND BRACKET THEREFOR

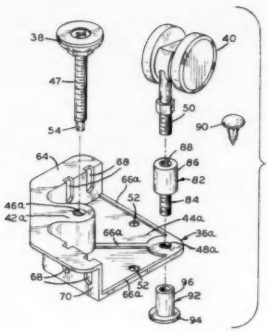
Jay M. Henriott, Jasper; Grover L. Miller, Chrisney, and Chad M. Schnell, Jasper, all of Ind., assignors to Kimball International, Inc., Jasper, Ind.

Provisional application No. 60/058,311, filed on Sep. 9, 1997. This application Sep. 2, 1998, Appl. No. 145,768.

Int. Cl. B60B *33/00*

U.S. Cl. 16—29 **23 Claims**

1. A bracket for a furniture unit, comprising an upper mounting plate and a lower mounting plate, said upper and lower mounting plates vertically distanced from each other, one of said upper and lower mounting plates providing a mount for a caster, the other of said upper and lower mounting plates providing a mount for a



floor-engaging leveler, and wherein said bracket provides a brace for the furniture unit.

US 6,408,483 B1

BRAKING RETARDATION APPARATUS

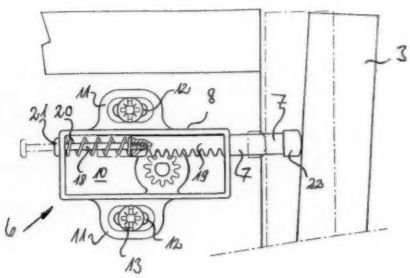
Luciano Salice, Carimate, Italy, assignor to Arturo Salice S.p.A., Novedrate/Como, Italy

Filed Nov. 30, 1999, Appl. No. 451,134

Claims priority, application Germany, May 4, 1999, 299 07 931 U; Jun. 17, 1999, 299 10 626 U; Nov. 30, 1999, 298 21 364 U

Int. Cl. E05F *5/06*

U.S. Cl. 16—85 **13 Claims**



1. A braking retardation apparatus for doors (**3**) and comprising

a push rod (**7**) arranged to be pressed into a housing (**8**) against braking force, wherein

the push rod (**7**, **18**, **19**) is structured and arranged to be movable in guides (**15**, **17**) of the housing (**8**) and possesses a section constituted by a gear rack (**19**),

comprising a rotary shock absorber (**25**) mounted in the housing (**8**) and comprising a pinion (**26**) structured and arranged to mesh with the gear rack (**19**), and

the push rod (**7**) being structured and arranged to be guided in boreholes (**17**) or openings (**15**) of housing walls (**14**, **16**) opposite each other.

US 6,408,484 B1

DOOR POSITIONING MEANS

Johan Martin Vandertouw, 113 Galston Road, Hornsby Heights, New South Wales, Australia, 2077

PCT No. PCT/AU98/00754, § 371 Date Jul. 17, 2000, § 102(e) Date Jul. 17, 2000

PCT Filed Sep. 15, 1998, Appl. No. 554,472

Claims priority, application Australia, Sep. 15, 1997, 37590/97

Int. Cl. E05D *11/10*

U.S. Cl. 16—320 **36 Claims**

1. A device for positioning a door, said device comprising:

a flat plate adapted to be flush mounted at a plate position that is under or over a door;

said plate having a straight edge usable for orienting said plate relative to the door;

said plate further having at least one stationary magnet located along an arcuate path on said plate, said path comprising a portion of a circular path and being not a completely circular path;

a door-mountable magnet adapted for attachment to a door-mounting position that is at an upper edge of the door or a lower edge of the door,

wherein, when the plate is mounted at the plate position above the door and said door-mountable magnet is attached to the door-mounting position at the upper edge of the door, said at least one stationary magnet and said door-mountable magnet interact with each other to position the door, or

wherein, when said plate is mounted at the plate position below the door and said door-mountable magnet is attached to the door-mounting position at the lower edge of the door, said at least one stationary magnet and said door-mountable magnet interact with each other to position the door.

US 6,408,485 B1

HINGE

Yu-Chih Wu, 13/F-1, No. 16, Lane 15, Fulien St., Hsitun Dist., Taichung City, Taiwan

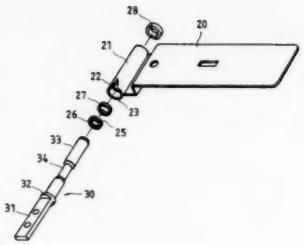
Filed Feb. 21, 2001, Appl. No. 788,394

Int. Cl. E05D *11/08*

U.S. Cl. 16—342 **8 Claims**

1. A hinge fastened to two movable parts of a computer apparatus for enabling said movable parts to be turned relative to each other, the hinge comprising:

a mounting frame fixedly fastened to one movable part of the computer apparatus, said mounting frame comprising a barrel transversely disposed at one side thereof, said barrel comprising an axially extended through hole, an orifice at one end of said axially extended through hole, said orifice having a diameter greater than said axially extended through hole;



a pivot shaft, said pivot shaft comprising a shaft body inserted through the axially extended through hole of said barrel of said mounting frame, a flat rear mounting tail axially extended from one end of said shaft body and fixedly fastened to the other movable part of the computer apparatus opposite to said mounting frame, a collar disposed between said shaft body and said flat rear mounting tail and stopped at one end of said barrel of said mounting frame, said shaft body comprising a neck in the middle, and a head stopped at the other end of said barrel of said mounting frame remote from said collar; and

a springy rubber ring mounted on the shaft body of said pivot shaft and fitted into the orifice of said barrel of said mounting frame and stopped between one end of said axially extended through hole of said barrel of said mounting frame and said collar of said pivot shaft and adapted to support said pivot shaft in said barrel of said mounting frame in position.

US 6,408,486 B1

HINGE ASSEMBLY FOR A SECTIONAL DOOR

Sam Saliba; Mitch Billows, and Gerhard Vogelgsang, all of Revesby, Australia, assignors to Evans Deakin Pty. Limited, Australia

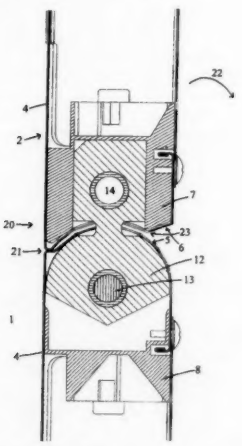
PCT No. PCT/AU99/00239, § 371 Date Jan. 26, 2001, § 102(e) Date Jan. 26, 2001, PCT Pub. No. WO99/50522, PCT Pub. Date Oct. 7, 1999

PCT Filed Mar. 31, 1999, Appl. No. 647,312

Claims priority, application Australia, Mar. 31, 1998, PP 2692

Int. Cl. E05D *5/00; 15/00*

U.S. Cl. 16—382 **20 Claims**



1. A hinge assembly, including:

a first hinge member having front and rear surfaces and a substantially semi-circular shaped first abutment surface spaced substantially equiradially about a substantially centrally provided pivot orifice;

a second hinge member having a second abutment surface being substantially of complementary shape to mate with said first abutment surface, and having a locking pin orifice therethrough;

a link member for releasably attaching said first and second hinge members and having a pair of orifices therethrough, the first of which is adapted to align with said pivot orifice and receive a pivot pin therethrough and a second of which is adapted to align with said locking pin orifice and receive a locking pin therethrough;

such that, said first and second hinge members can pivot relative to each other in a manner whereby said abutment surfaces are maintained substantially proximal to one another so as to substantially prevent human fingers or other objects being provided or pinched between said abutment surfaces.

US 6,408,487 B1

CARD WIRE, ESPECIALLY FOR DOFFERS AND WORKERS

Kenneth Ross Atkinson, Highton, Australia, assignor to Commonwealth Scientific and Industrial Research Organisation, Campbell, Australia

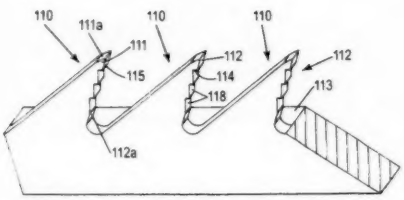
PCT No. PCT/AU99/00935, § 371 Date May 1, 2001, § 102(e) Date Apr. 5, 2001, PCT Pub. No. WO00/26450, PCT Pub. Date May 11, 2000

PCT Filed Oct. 28, 1999, Appl. No. 806,841

Claims priority, application Australia, Oct. 30, 1998, PP6810

Int. Cl. D01G *15/84*

U.S. Cl. 19—114 **21 Claims**



1. Card clothing comprising a strip of profile wire having a base and a plurality of longitudinally aligned teeth each having an overhanging tip and a leading edge-face under the overhanging tip, wherein said edge-face of each tooth includes at least one undercut edge-segment spaced along the edge-face from the tip, which undercut includes at least a portion of the undercut that is substantially parallel to the longitudinal dimension of the profile wire for holding fibers slipping up said edge-face and thereby increasing the retention of fibers by said edge-face during carding.

US 6,408,488 B1

DEVICE FOR SETTING THE CLEARANCE BETWEEN COOPERATING CLOTHINGS IN A FIBER PROCESSING MACHINE

Armin Leder, Mönchengladbach, and Jürgen März, Düsseldorf, both of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Germany

Filed Oct. 25, 2001, Appl. No. 983,607

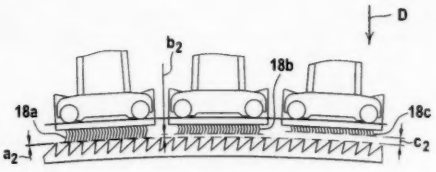
Claims priority, application Germany, Oct. 26, 2000, 100 53 139

Int. Cl. D01G *15/84*

U.S. Cl. 19—114 **10 Claims**

1. A fiber processing machine comprising

(a) a roll having a circumferential surface provided with a first clothing having clothing points;



(b) a counter member having a surface provided with a second clothing having clothing points; said first and second clothings cooperating with one another; and

(c) a device for setting a clearance between the clothing points of said first and second clothings; said device including

(1) means for approaching said roll and said counter member to one another until said clothing points of said first and second clothings contact;

(2) means for moving away said roll and said counter member from one another until said clothing points of said first and second clothings assume a desired clearance; and

(3) means for emitting a signal when said clothing points of said first and second clothings contact one another.

US 6,408,489 B1

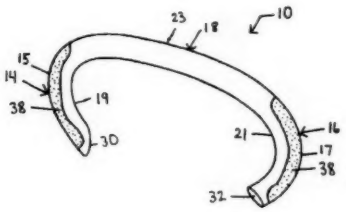
COLLATED AND LUBRICATED FASTENERS AND LUBRICATION STATION

Raymond F. Cluggish, Indianapolis, Ind., assignor to ASML Netherlands B.V., Veldhoven, Netherlands

Filed Apr. 20, 2000, Appl. No. 553,065

Int. Cl. F16B *45/00*

U.S. Cl. 24—20 CW **18 Claims**



1. A fastener for use with a crimping tool comprising:

a length of fastener metal wire bent into a generally C-shaped configuration to form an open ring fastener including:

spaced opposed curved free end portions integrally interconnected by a central connecting portion;

said open ring fastener being constructed and arranged to be (1) positioned in an installation position with respect to elongated elements to be connected together disposed between the spaced opposed free ends thereof, and (2) crimped by a pair of closing jaws of the crimping tool into a close ring formation in surrounding relation to the elongated elements wherein said free ends are lapped with respect to sections of said connecting portion;

said open ring fastener having a dry lubricant film on exterior surfaces of said curved free ends which slide with respect to the closing jaws when said open ring fastener is crimped so as to reduce the force required to effect the crimping movement;

said central connecting portion of said open ring fastener including an exterior surfaces devoid of said lubricant.

US 6,408,490 B1

WRISTWATCH QUICK FIXING DEVICE

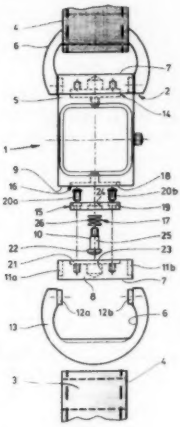
Emile Pequignet, Fournets-Luisans, France, assignor to Montres Pequignet, Morteau, France

PCT No. PCT/FR99/02873, § 371 Date Sep. 5, 2000, § 102(e) Date Sep. 5, 2000, PCT Pub. No. WO99/36838, PCT Pub. Date Jul. 22, 1999

PCT Filed Dec. 23, 1998, Appl. No. 600,613

Int. Cl. A44B *11/00*; **A44C** *5/24*

U.S. Cl. 24—265 WS **17 Claims**



1. A quick fastening device for fastening an end of a band to a case of a watch comprising:

a band linking element attached to the band;

a case linking element attached to the case, wherein the band and the case linking elements mutually interlock with each other and at least one of the band or the case linking elements is movably mounted on the band or the case to which it is interlocked between at least one open position and one closed position; and

wherein the band and the case linking elements are positioned respectively free for interlocking with respect to each other and fastened by interlocking with respect to each other.

US 6,408,491 B2

DEVICE FOR SECURING A WATCH STRAP TO A WATCH CASING

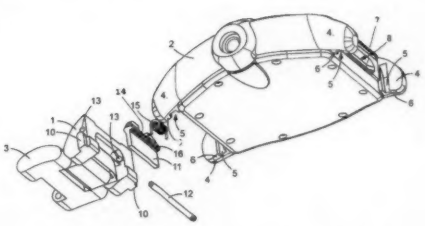
Jean-Pierre Guyard, Orchamps-Vennes, France, assignor to Conseils et Manufactures VLG SA, Neuchatel, Switzerland

Filed Dec. 11, 2000, Appl. No. 732,870

Claims priority, application European Pat. Off., Feb. 25, 2000, 00103952

Int. Cl. G04B *37/16*; **A44B** *11/25*

U.S. Cl. 24—265 WS **6 Claims**

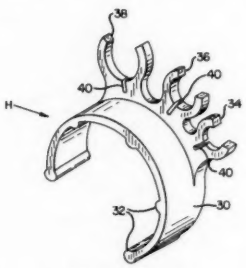


1. A device for securing a watch strap on a watch casing, comprising:

an intermediate element adapted to be secured to an end of the watch strap, this intermediate element being adapted to be received between lugs of the watch casing by slideably engaging a complementary formation on lateral surfaces of the intermediate element and internal surfaces of the lugs; and

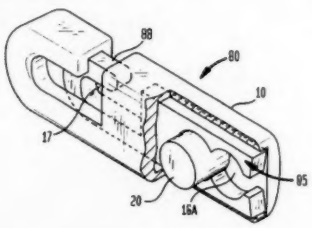
a flap pivoted about an axis transverse to the watch strap and subject to resilient action, this flap comprising a locking nose coacting with a locking surface on an end surface of the watch casing, this nose being applied by said resilient action against said locking surface when the intermediate element is between the lugs of the casing.

US 6,408,492 B1
HOLDER FOR SLENDER ELONGATED ARTICLES SUCH AS FISHING ROD SECTIONS
Ronald V. Sparks, and Sharon Lee Sparks, both of 320 SE. Hale Dr., Gresham, Oreg. 97030
Filed Mar. 21, 1988, Appl. No. 170,932
Int. Cl. A44B *21/00*
U.S. Cl. 24—336 **1 Claim**



1. A holder for fishing rod sections comprising a body of resilient material having an arcuate base portion slightly exceeding 180° in arcuate extent, a plurality of radial protrusions extending axially on the inside arcuate surface of said arcuate base portion to grip a handle portion of a fishing rod, and a plurality of arcuate clips of different sizes outstanding from said base portion in radial directions side by side in a common plane perpendicular to the central axis of said arcuate base portion for holding fishing rod sections, the thickness of said clips in an axial direction being a small fraction of the thickness in an axial direction of said base portion, and all of said clips having one face in a common plane with one axial end of said base portion and an opposite face between the axial ends of said base portion.

US 6,408,493 B1
JEWELRY CLASP
David Yurman, New York, and Don Johnson, Rego Park, both of N.Y., assignors to Yurman Design Inc., New York, N.Y.
Filed Jun. 22, 2000, Appl. No. 602,358
Int. Cl. F16B *45/04*
U.S. Cl. 24—600.4 **9 Claims**



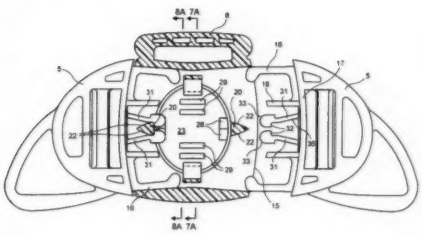
1. A jewelry clasp, comprising:

a casing at least partially hollow having at least one long axis running from a leading edge to a trailing edge, a top surface with an opening for receiving a loop to be secured by said clasp, and a recess within said casing accessible through said opening;

an insert residing within said hollow of said casing and movable along the long axis of said casing, said insert having a leading edge and a first hole stop and a second hole stop, said first hole stop and second hole stop being connected via a passage; and

a pin fixed in position within said casing perpendicular to said long axis of said casing, said pin passing through said insert at one of said stops.

US 6,408,494 B1
THREE-WAY PUSH RELEASE BUCKLE HAVING IMPROVED LATCHING CAPABILITY
Joseph Anscher, 1928 Midlane Rd., Muttontown, N.Y. 11791
Filed Mar. 1, 2000, Appl. No. 516,977
Int. Cl. A44B *11/26*
U.S. Cl. 24—625 **27 Claims**



1. A buckle comprising:

a socket member having an obverse face and a pair of sides, wherein the obverse face and the sides define a socket therebetween, the socket member having a first open end and a second open end;

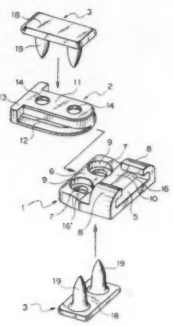
a button belonging to the socket member, the button being depressible in a first direction to a location in which at least a portion of the button projects inside the socket;

at least one engaging member disposed in the interior of the socket;

a first plug member and a second plug member, each plug member having a base portion and at least one resiliently flexible leg extending from the base portion, said at least one resiliently flexible leg defining a latching surface thereon, said at least one resiliently flexibly leg permitting movement of the latching surface in at least one second direction, each of the at least one second direction being non-parallel to the first direction;

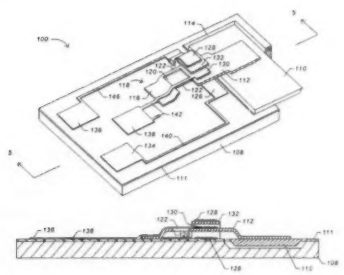
wherein the socket member is adapted to slidably receive the legs of the plug members through the open ends of the socket member so as to couple the plug members to the socket member, and wherein said at least one engaging member of the socket member engages the latching surfaces of the legs of the first and second plug members to lock the plug members to the socket member when the plug members are coupled to the socket member, and wherein the plug members may be unlocked from the socket member by depressing the button in the first direction toward the interior of the socket so as to disengage the latching surfaces from the at least one engaging member in one of the at least one second direction and thereby permit decoupling of the plug members from the socket member.

US 6,408,495 B2
HOOK FOR CLOTHES
Kazuo Ida, Toyama-ken, Japan, assignor to YKK Corporation, Tokyo, Japan
Filed Feb. 23, 2001, Appl. No. 790,669
Claims priority, application Japan, Feb. 29, 2000, 2000-053959
Int. Cl. A44B *13/00*
U.S. Cl. 24—702 **7 Claims**



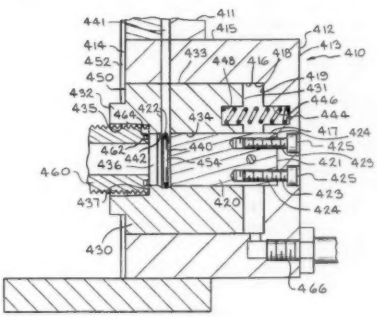
1. A hook for clothes, comprising: a female member, a male members and attaching members, wherein said female members has an upheaved portion at an end of its base plate; attaching holes in said upheaved portion; hook-shaped engaging pieces on both sides of the base plate such that they oppose each other in inward direction; said male member has a concave portion on a side face of its base plate allowing said engaging pieces to fix with play; an engaging protruded portion provided laterally at a rear end of said concave portion; attaching holes in said base plate of said male member; said attaching members has attaching posts capable of being inserted into each of said attaching holes of said female and male members, provided on a face of its flat seat plate.

US 6,408,496 B1
METHOD OF MANUFACTURING A VIBRATIONAL TRANSDUCER
Ron S. Maynard, San Jose, Calif., assignor to Ronald S. Maynard, Austin, Tex.
Provisional application No. 60/052,040, filed on Jul. 9, 1997. This application Jun. 10, 1998, Appl. No. 94,442.
Int. Cl. H04R *17/10;* **H01L** *41/18*
U.S. Cl. 29—25.35 **10 Claims**



1. A method for fabricating a vibrational transducer, said method comprising:
providing a base structure;
forming a cantilever beam anchored at one end on the base structure;
forming an inertial mass on a free end of the cantilever beam, wherein the inertial mass is disposed to vibrate in a free space;
forming an electrically conductive element on the beam between the anchored end and the free end;
forming an electrically conductive drive element disposed adjacent to, opposite of, and spaced-apart from the electrically conductive element on the cantilever beam, wherein said electrically conductive drive element is fixed relative to the base structure; and
forming a housing over the base structure.

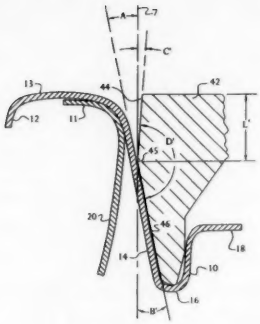
US 6,408,497 B1
FACE SEAL O-RING INSERTION TOOL
Merle A. Whetstone, Van Wert, Ohio, assignor to Aeroquip Corporation, Maumee, Ohio
Division of application No. 09/111,972, filed on Jul. 8, 1998, now Pat. No. 6,012,209, Provisional application No. 60/055,166, filed on Aug. 8, 1997. This application Oct. 22, 1999, Appl. No. 426,170.
Int. Cl. B23P *19/02*
U.S. Cl. 29—235 **4 Claims**



1. A tool for inserting a flexible O-ring in a connector having a recess including a lip, comprising:
a base defining at least one base cavity;
a ram mounted on said base in said base cavity, said ram having an end adapted to engage said O-ring;
a sleeve movably mounted in said base cavity adjacent said ram, said sleeve defining an O-ring slot for receiving and positioning said O-ring adjacent said ram, said sleeve further defining an opening having a chamfered edge adjacent said O-ring slot, whereby said connector is positioned adjacent said opening, said sleeve is moved with respect to said ram, said ram pushes said O-ring toward said recess, said chamfered edge and said opening engage said O-ring to cause said O-ring to flex inwardly during pushing by said ram to allow said O-ring to pass said lip and enter said recess.

US 6,408,498 B1
CAN END HAVING A STRENGTHENED SIDE WALL AND APPARATUS AND METHOD OF MAKING SAME
Brian Fields, Hinsdale, and Lloyd Wilson, Aurora, both of Ill., assignors to Crown Cork & Seal Technologies Corporation, Alsip, Ill.
Division of application No. 09/140,722, filed on Aug. 26, 1998, now Pat. No. 6,102,243. This application Jul. 26, 2000, Appl. No. 625,772.
Int. Cl. B23P *11/00*
U.S. Cl. 29—243.5 **5 Claims**

1. A chuck for use in seaming a can end to a can body, said chuck defining a central axis thereof, said can end having a side



wall disposed at an angle A with respect to said central axis in the range of about 12° to 15°, comprising:

a) an upper portion forming an upper wall, said upper wall being disposed at an angle C with respect to said central axis that is within the range of about 0° to −2°; and

b) a lower portion forming a lower wall, said lower wall being substantially frustoconical and disposed at an angle D' with respect to said upper wall that is within the range of about 162° to 168° and being disposed at an angle B' with respect to said central axis that is not greater than about 16°.

US 6,408,499 B1

ASSEMBLY PLATFORM SYSTEM FOR CEILING FANS

James R. Roton, and Jacqueline Roton, both of 808 Jefferson St., Minden, La. 71055

Filed Dec. 8, 1999, Appl. No. 456,735

Int. Cl. B25B *27/14*

U.S. Cl. 29—281.1 **1 Claim**

1. An assembly platform system for ceiling fans comprising:

a round, cylinder shaped, open-ended, support tube;

a fan part support shelf; and

a number of insert structures;

said round, cylinder shaped, open-ended, support tube having an exterior cylinder diameter, three telescoping leg assemblies extending from an exterior cylinder bottom surface, a ring shaped shelf support flange extending around said circumference of said exterior side surface of said support tube and extending outward a first extension distance from an exterior side surface of said support tube, and a fan portion receiving cavity formed within said support tube and accessible through a round opening having an interior opening diameter;

said fan part support shelf having a round cylinder passage opening having a shelf aperture diameter greater than said exterior cylinder diameter but less than the sum of said exterior cylinder diameter and twice said first extension distance such that said ring shaped shelf support supports said fan part support shelf when said support tube is inserted through said round cylinder passage opening;

said number of insert structures each including an insertion flange sized to friction fit into said round opening of said support tube and a fan portion passage opening having a diameter less than said interior opening diameter of said round opening.

US 6,408,500 B1

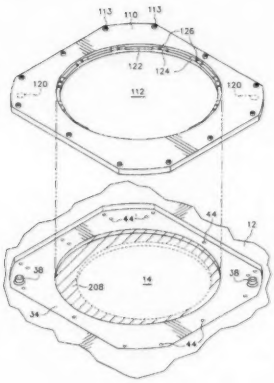
METHOD OF RETROFITTING A PROBE STATION

James Orsillo, P.O. Box 68991, Portland, Oreg. 97268

Filed Sep. 15, 2000, Appl. No. 662,735

Int. Cl. B23P *17/04*

U.S. Cl. 29—401.1 **10 Claims**



1. A method of retrofitting a probe station having an original head plate, so that said probe station may be easily configured to mate with a probe card dish and any tester out of a set of testers, said method comprising the steps of:

(a) removing said original head plate from said probe station;

(b) machinery said original head plate to provide having a head plate-tooling plate attachment region, including head plate-tooling plate attachment region alignment items;

(c) attaching said replacement headplate to said probe station; and

(d) providing a set of tooling plates, each having fastening and alignment items adapted to easily mate to said head plate-tooling plate attachment region alignment items and defining an aperture designed to engage a probe card dish and including docking equipment adapted to facilitate docking to a tester out of said set of testers, said set of tooling plates including, for each particular tester out of said set of testers, a tooling plate adapted to facilitate attachment to said particular tester.

US 6,408,501 B1

AUTOMATIC SYSTEM OF MANUFACTURING BALL STUDS FOR VEHICLES

Sung Hwan Kim, Kyoungsangnamdo, Rep. of Korea, assignor to Central Corporation, Kyoungsangnamdo, Rep. of Korea

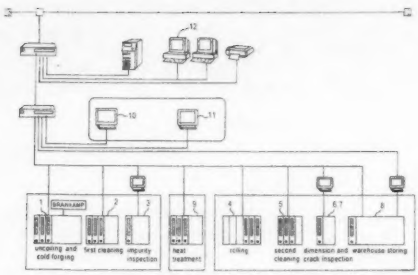
Continuation-in-part of application No. 09/210,722, filed on Dec. 14, 1998, now abandoned. This application Nov. 13, 2000, Appl. No. 709,385.

Claims priority, application Rep. of Korea, Jul. 30, 1998, 98-30949

Int. Cl. B23Q *17/00*

U.S. Cl. 29—407.01 **4 Claims**

1. An apparatus of automatically manufacturing ball studs comprising:



a cold forging unit for uncoiling and forming a cold coil for ball studs into ball studs shaped at least 50% similar to a desired one;

a first cleaning unit for removing burrs or lubricant layers of materials from said cold forged ball studs;

an impurity inspection unit for determining whether the burrs or lubricant layers are properly removed;

a unit for rolling a head, a neck and threads with a rolling machine;

a second cleaning unit for completely removing impurities from the ball studs;

an inspection unit for finding dimensional defects and minute breaks or cracks from said ball studs after the second cleaning;

a storage unit for storing said ball studs into a warehouse by an automated transport robot after the inspection;

a central control unit for controlling said units to be operated in sequence, performing an emergency stop of said units in response to a defect signal from said inspection unit, and diagnosing abnormal conditions of said units; and

an FMS server for storing product data related to said abnormal and operated conditions and amount of production into a database and transmitting the same in the case of necessity.

US 6,408,502 B1

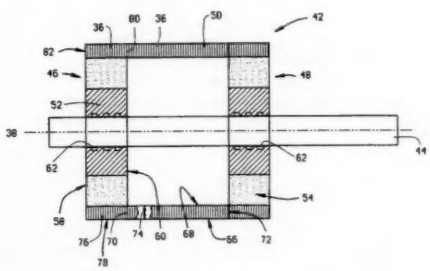
METHOD FOR A RESILIENT ROTOR CORE ASSEMBLY

Subhash M. Brahmavar, and Kamron M. Wright, both of Fort Wayne, Ind., assignors to General Electric Company, Schenectady, N.Y.

Filed May 18, 2001, Appl. No. 681,679

Int. Cl. H02K *15/16*

U.S. Cl. 29—596 **5 Claims**



1. A method of constructing a rotor mount assembly to facilitate damping vibration of a rotor shaft, said method comprising the steps of:

coupling a first resilient ring on the rotor shaft;

coupling a second resilient ring on the rotor shaft;

attaching a laminated spacer to the first resilient ring and the second resilient ring; and

attaching a plurality of magnetic elements to the spacer.

US 6,408,503 B1

METHOD OF MAKING INJECTION-MOLDER HEATING ELEMENT

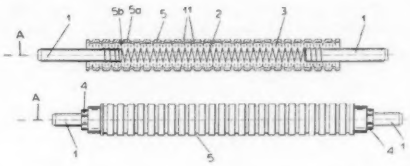
Eugen Schwarzkopf, Lüdenscheid, Germany, assignor to Hotset Heizpatronen U. Zubehor GmbH, Ludenscheid, Germany

Filed Oct. 21, 1999, Appl. No. 422,704

Claims priority, application Germany, Mar. 18, 1999, 199 12 084

Int. Cl. H05B *3/00*

U.S. Cl. 29—611 **4 Claims**



1. A method of making a heater element comprising the steps of:

inserting into a tubular casing a heating wire;

filling a space between the wire and the casing with a compressible insulating mass;

closing ends of the space to confine the mass in the casing; and

radially inwardly compressing and plastically deforming the casing to form in it a succession of radially outwardly open annular grooves that extend circumferentially fully around the casing and that form axially relatively long and radially relatively thick outer rings and axially relatively short and radially relatively thin inner rings and thereby radially compressing the insulating mass.

US 6,408,504 B2

PROCESS AND APPARATUS FOR ASSEMBLING VEHICLE BODY FRAME FOR MOTORCYCLE

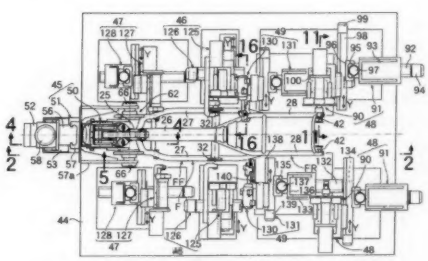
Naoji Yamaoka; Hidekazu Ryu; Teiji Miwa; Isamu Ishizaki, and Hisashi Hoshi, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 2001, Appl. No. 865,713

Claims priority, application Japan, May 30, 2000, 2000-164757; May 30, 2000, 2000-164758; May 30, 2000, 2000-164759; May 30, 2000, 2000-164760

Int. Cl. B23P *21/00*

U.S. Cl. 29—709 **7 Claims**



1. An apparatus for assembling a vehicle body frame for a motorcycle by welding a front frame subassembly having a head pipe at a front end thereof and a rear frame subassembly to each other, comprising a pair of front positioning means capable of positioning left and right rear portions of the front frame subassembly, a front clamp means capable of clamping the head pipe at the front end of the front frame subassembly, a pair of rear positioning means capable of positioning left and right rear portions of the rear frame subassembly, a pair of rear clamp means capable of clamping left and right front portions of the rear frame

subassembly, a pair of front positioning drive means for moving said front positioning means at least in a direction of a Y-axis established in a widthwise direction of said vehicle body frame, respectively, a front clamp drive means which is capable of moving said front clamp means in directions of Z- and X-axes established in vertical and longitudinal directions of said vehicle body frame and is capable of tilting said front clamp means about an axis extending along the Y-axis, a pair of rear positioning drive means capable of moving said rear positioning means in the directions of X-, Y- and Z-axes, respectively, a pair of rear clamp drive means capable of moving said rear clamp means in the directions of X-, Y- and Z-axes, respectively, and a control unit for controlling the operations of said drive means, so that said front positioning means, said front clamp means, said rear positioning means and said rear clamp means are brought into positions previously determined depending on the type of the vehicle body frame for the motorcycle, which is to be assembled.

US 6,408,505 B1

COMPONENT MOUNTING APPARATUS

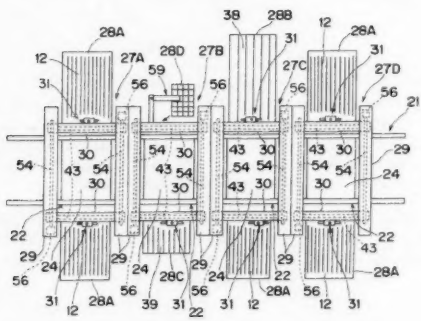
Kanji Hata, Katano, and Noriaki Yoshida, Ikeda, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of application No. 09/010,490, filed on Jan. 21, 1998, which is a continuation of application No. 08/740,992, filed on Nov. 5, 1996, now Pat. No. 5,778,525. This application Mar. 24, 2000, Appl. No. 534,260.

Claims priority, application Japan, Nov. 6, 1995, 7-286969

Int. Cl. B23P *19/00*

U.S. Cl. 29—740 **10 Claims**



1. A component mounting apparatus comprising:

a pair of component supply tables for accommodating a plurality of components, said component supply tables being arranged on opposite sides of a board mounting position;

a first mounting head section having a rotary member rotatably supported around a horizontal axis, the first mounting head section successively picking up the plural components at one of the component supply tables while the rotating member is rotated and stopped, thereafter moving to a board positioned at the board mounting position, and thereafter successively mounting the plural picked-up components onto the board while moving in first and second directions which are perpendicular to each other and while the rotating member is rotated and stopped,

wherein the first direction is perpendicular to a direction in which the board is transferred, and the second direction is located along the board transfer direction,

a second mounting head section for successively picking up the plural components at the other of the component supply tables, thereafter moving to the board positioned at the board mounting position, and thereafter successively mounting the plural picked-up components onto the board while moving in third and fourth directions which are perpendicular to each other,

wherein the third direction is parallel to the first direction, and the fourth direction is parallel to the second direction but is not necessarily the same as the second direction,

wherein each of the first and second mounting head sections is independently movable between the component supply table and the board.

US 6,408,506 B2

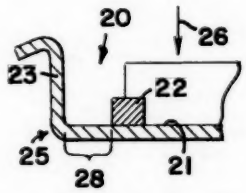
ELECTRICAL ENCLOSURE HAVING IMPROVED SEALING AND SHIELDING COMPONENT AND METHOD OF MANUFACTURE THEREOF

John Emil Richard, Rogers; William Joseph Nepsha, Blaine, both of Minn.; Timothy Lloyd Mullen, Hudson, Wis.; Thomas R. Hurney, Anoka, Minn., and Paul Rutherford, Jr., Straubenhardt, Germany, assignors to Hoffman Enclosures, Inc., Anoka, Minn.

Division of application No. 09/036,150, filed on Mar. 6, 1998, now Pat. No. 6,188,014. This application Feb. 28, 2001, Appl. No. 795,597.

Int. Cl. H01R *43/00*

U.S. Cl. 29—825 **17 Claims**



1. A method of manufacturing an electrical enclosure having an enclosure structure with a base surface and an outer lip about a perimeter of the base surface, comprising:

pressing a fixture against a wire mesh to position the wire mesh against the base surface, wherein a channel is defined between the wire mesh and the outer lip of the enclosure structure;

applying a foam in the channel while pressing the wire mesh against the base surface with the fixture; and

removing the fixture, wherein the foam adheres to the base surface and holds the wire mesh in position.

US 6,408,507 B1

HEAT SINK TO SEMICONDUCTOR MODULE ASSEMBLY EQUIPMENT AND METHOD

Seok Goh, Cheon-an, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Nov. 17, 2000, Appl. No. 715,627

Claims priority, application Rep. of Korea, Nov. 17, 1999, 99-51106

Int. Cl. H05K *3/30*

U.S. Cl. 29—832 **15 Claims**

1. Equipment for attaching heat sinks to semiconductor modules, the equipment comprising:

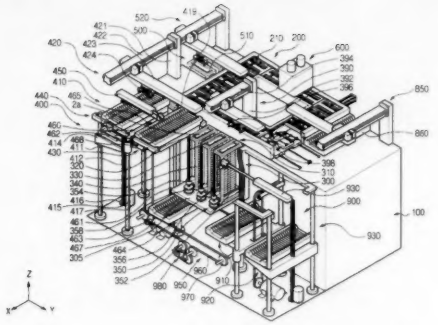
a base body;

a built-up pad conveying unit mounted at the upper center of the base body, the built-up pad conveying unit having a plurality of built-up pads;

a first heat sink supply unit that seats the first heat sink, from which a rivet is projected, on a built-up pad at a corresponding station of the built-up pad conveying unit;

a semiconductor module unloading unit that seats the semiconductor module with the rivet through a hole in the semiconductor module after the built-up pad, on which the first heat sink is seated, is transferred one step;

a second heat sink supply unit that seats a second heat sink with the rivet through a hole in the second heat sink, after the



built-up pad, on which the combined first heat sink and semiconductor module are seated, is transferred another step;

a riveting unit that works an end of the rivet of the first heat sink after the built-up pad with the first heat sink, the semiconductor module, and the second heat sink is transferred another step;

a semiconductor product loading unit that loads the semiconductor products, which are connected to the first and second heat sinks after the riveting of a rivet machine, on a tray; and

a tray conveying unit for transferring the tray from the semiconductor module unloading unit to the semiconductor product loading unit.

12. A method for assembling heat sink to semiconductor module, the method comprising:

seating a first heat sink, on which a rivet is mounted, on a pad of a pad conveying unit and transferring the pad one step;

seating a semiconductor module transferred from a tray on the first heat sink on the pad and transferring the pad another step, wherein this seating inserts the rivet of the first heat sink through a hole in the semiconductor module;

seating a second heat sink on the semiconductor module that is on the pad and transferring the pad another step, wherein this seating inserts the rivet of the first heat sink through a hole in the second heat sink;

deforming an end of the rivet of the first heat sink on the transferred pad to fix the first and second heat sinks on the semiconductor module to form a semiconductor product and transferring the pad another step; and

unloading the semiconductor product, which are located on the pad, onto empty tray after unloading all of the semiconductor modules from the tray.

US 6,408,508 B1
METHOD FOR MAKING FLEXIBLE TRACE SURFACE CIRCUIT BOARD
Warren M. Farnworth, Nampa, and Kevin G. Duesman, Boise, both of Id., assignors to Micron Technology, Inc., Boise, Id.
Filed Jul. 30, 1999, Appl. No. 365,220
Int. Cl. A05K *3/34*
U.S. Cl. 29—840 **24 Claims**

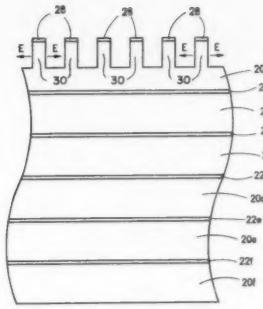
1. A method of manufacturing a circuit board comprising the steps of:

providing a substrate;

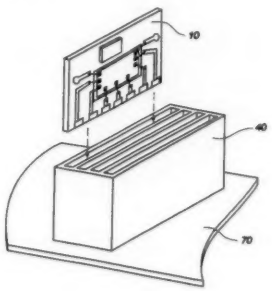
depositing a conductive layer on the substrate;

removing portions of the conductive layer to form a plurality of traces; and

removing corresponding portions of the substrate such that a flexible trace surface is formed, the flexible trace surface comprising a plurality of flexible protuberances formed from the substrate, each of the flexible protuberances having a top surface, and the traces being attached to the top surface of a corresponding protuberance.



US 6,408,509 B1
VERTICALLY MOUNTABLE INTERPOSER, ASSEMBLY AND METHOD
Larry D. Kinsman, Boise; Walter L. Moden, Meridian, and Warren M. Farnworth, Nampa, all of Id., assignors to Micron Technology, Inc., Boise, Id.
Division of application No. 09/001,406, filed on Dec. 31, 1997, now Pat. No. 6,191,474. This application Oct. 12, 1999, Appl. No. 417,138.
Int. Cl. H05K *3/34*
U.S. Cl. 29—840 **18 Claims**



1. A method for establishing an electrical connection between a semiconductor device and a carrier substrate, comprising:

attaching the semiconductor device to an interposer;

attaching an alignment device to the carrier substrate, said alignment device including a receptacle;

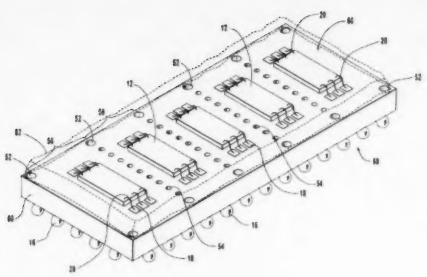
inserting said interposer into said receptacle; and

establishing an electrical connection between the semiconductor device and the carrier substrate.

US 6,408,510 B1
METHOD FOR MAKING CHIP SCALE PACKAGES
David R. Hembree, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Division of application No. 09/023,674, filed on Feb. 13, 1998. This application Apr. 1, 1999, Appl. No. 285,017.
Int. Cl. H05K *3/30*
U.S. Cl. 29—841 **25 Claims**

1. A method for moving a substrate panel for chip packaging comprising:

providing a unitary substrate panel comprising:

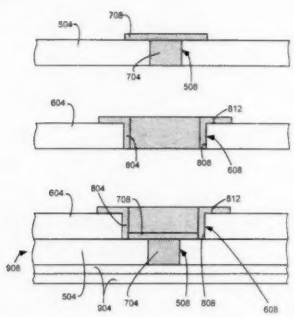


a plurality of indexing holes therein;
a top portion opposite a bottom portion;
a plurality of electrically conductive vias therethrough;
a plurality of die attach areas on the top portion;
a plurality of conductive landings on the top portion; and
a plurality of break lines for singulating the substrate panel into a plurality of chip scale packages;
moving the substrate panel to chip package fabrication equipment by extending indexing pins into at least portion of the plurality of indexing holes and moving said indexing pins, said chip package fabrication equipment including at least one of die attach, wire bonding, solder ball soldering, and encapsulation equipment.

US 6,408,511 B1
METHOD OF CREATING AN ENHANCED BGA ATTACHMENT IN A LOW-TEMPERATURE CO-FIRED CERAMIC (LTCC) SUBSTRATE

Shaul Branchevsky, Mission Viejo, Calif., assignor to National Semiconductor, Inc., Santa Clara, Calif.

Filed Aug. 21, 2000, Appl. No. 643,387
Int. Cl. H01R *9/00*
U.S. Cl. 29—843 **11 Claims**

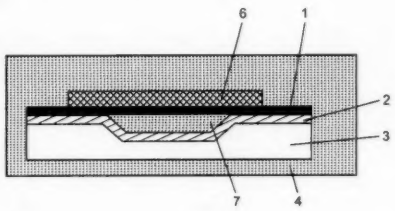


1. A method of forming a substrate for a ball grid array, comprising the steps of:
punching an array of vias in a first tape layer;
filling the vias in the first tape layer with an electrically conductive material;
forming a plurality of termination pads, wherein each termination pad is over a via of the array of vias in the first tape layer, and wherein the plurality of termination pads are on a first side of the first tape layer;
punching an array of vias in a second tape layer;
forming a plurality of termination sides, wherein each termination side of the plurality of termination sides is formed on a side wall of a via of the array of vias in the second tape layer;
placing the first tape layer adjacent to the second tape layer; and
firing the first tape layer and the second tape layer so that the plurality of termination sides and the plurality of termination pads form a plurality of termination cups over the vias of the first tape layer and at least partially within the vias of the second tape layer;
forming a plurality of diffusion barriers, wherein each diffusion barrier is over a termination cup of the plurality of termination cups; and
electrically and mechanically connecting an electrically conductive ball to each of the diffusion barriers.

US 6,408,512 B1
METHOD OF CORRECTING DEFORMED TURBINE BLADES

Andreas Boegli, Wettingen; Markus Schmid, Baden, and Wolfgang Mueller, Rieden, all of Switzerland, assignors to Alstom (Switzerland) Ltd., Baden, Switzerland

Filed May 18, 2000, Appl. No. 573,871
Claims priority, application Germany, Jun. 5, 1999, 199 25 781
Int. Cl. B23P *15/00*
U.S. Cl. 29—889.1 **6 Claims**

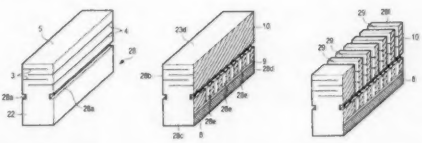


1. A method of correcting deformed turbine components made of an Ni- or Co-based casting alloy, the method comprising:
rigidly fixing the deformed turbine component to a matrix which contains a specified mold;
plunging the deformed turbine component with the matrix into an incompressible medium; and
introducing a pressure wave into the incompressible medium or producing a pressure wave directly on a surface, to be formed, of the turbine component.

US 6,408,513 B1
METHOD FOR MANUFACTURING A PIEZOELECTRIC VIBRATOR UNIT

Tsuyoshi Kitahara; Minoru Usui, and Satoru Hosono, all of Nagano, Japan, assignors to Seiko Epson Corporation, Osaka, Japan

Division of application No. 09/254,010, filed as application No. PCT/JP98/02874, filed on Jun. 26, 1998. This application Nov. 21, 2001, Appl. No. 989,378.
Claims priority, application Japan, Jun. 27, 1997, 9-187593; Jul. 30, 1997, 9-219258; Jul. 31, 1997, 9-220199; Oct. 8, 1997, 9-291720; Jun. 24, 1998, 10-177886
Int. Cl. B21D *53/76;* **B41J** *2/045*
U.S. Cl. 29—890.1 **5 Claims**



5. A method for manufacturing a piezoelectric vibrator unit comprising the steps of:

preparing a lamination in which a conductive layer to be a common internal electrode and a conductive layer to be an individual electrode are alternately laminated while sandwiching a piezoelectric material therebetween such that a non-vibrational area is formed in a bottom portion thereof;

baking the lamination to prepare a piezoelectric diaphragm;

forming a first conductive layer and a second conductive layer on that faces of the diaphragm so as to extend from an area on which the internal electrodes are exposed to that area in the vicinity of the non-vibrational area;

securing a reinforcing plate on an end portion of the non-vibrational area side of the diaphragm;

securing the first conductive layer of the diaphragm to a fixing substrate having a conductivity at least in that portion the first conductive layer is secured to;

forming a groove so at least the piezoelectric diaphragm as to be parted.

US 6,408,514 B1

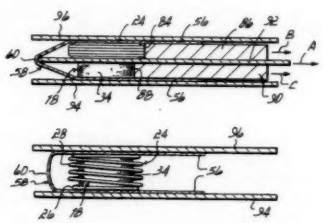
MANUFACTURE OF POCKETED COMPOUND NESTED COIL SPRINGS

Niels S. Mossbeck, and Thomas J. Wells, both of Carthage, Mo., assignors to L&P Property Management Company, South Gate, Calif.

Continuation of application No. PCT/US99/19419, filed on Aug. 25, 1999, which is a continuation-in-part of application No. 09/139,448, filed on Aug. 25, 1998. This application May 31, 2000, Appl. No. 584,606.

Int. Cl. B21F *35/00*

U.S. Cl. 29—896.92 **23 Claims**



1. A method of forming a string of pocketed compound nested coil springs, the method comprising the steps of:

forming a plurality of individual first coil springs each of a first uncompressed height and having a longitudinal axis;

orienting each of the first coil springs with its longitudinal axis at a first inclination;

forming a plurality of individual second coil springs each of a second uncompressed height which is greater than the first uncompressed height of the first coil springs, each of the second coil springs having a longitudinal axis extending between spaced terminal coils thereof;

aligning the longitudinal axes of each of the first coil springs with one of the second coil springs;

nesting each of the first coil springs into one of the second coil springs by passing the first coil spring into one of the terminal coils of one of the second coil springs and thereby forming a nested spring unit;

compressing each of the first and second coil springs;

folding an elongate sheet of fabric about a longitudinal fold line into two plies of fabric joined by the longitudinal fold line;

inserting one of the first and one of the second coil springs between the plies of the folded fabric;

wherein the nesting of each of the first coil springs into one of the second coil springs occurs after the inserting between the plies of the folded fabric; and

forming an individual pocket in the fabric around each of the nested spring units, wherein the individual fabric pocket is formed around each of the first coil springs prior to nesting it into one of the second coil springs.

14. A method of forming a string of pocketed compound nested coil springs, the method comprising the steps of:

forming a plurality of individual first coil springs each of a first uncompressed height and having a longitudinal axis;

forming a plurality of individual second coil springs each of a second uncompressed height which is greater than the first uncompressed height of the first coil springs, each of the second coil springs having a longitudinal axis extending between spaced terminal coils thereof;

wherein each of the second coil springs is formed around one of the first coil springs to thereby form a nested spring unit;

aligning the longitudinal axes of each of the first coil springs with one of the second coil springs;

compressing each of the first and second coil springs;

folding an elongate sheet of fabric about a longitudinal fold line into two plies of fabric joined by the longitudinal fold line; inserting the nested spring unit between the plies of the folded fabric; and forming an individual pocket in the fabric around each of the nested spring units.

US 6,408,515 B1

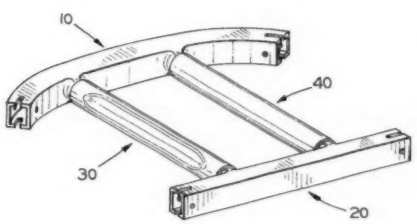
METHOD FOR MANUFACTURING AN ENGINE CRADLE FOR A VEHICLE FRAME ASSEMBLY

Robert D. Durand, Wyomissing, Pa., assignor to Dana Corporation, Toledo, Ohio

Filed Aug. 20, 1998, Appl. No. 137,326

Int. Cl. B21D *53/88*

U.S. Cl. 29—897.2 **11 Claims**



1. A method for manufacturing a combined engine cradle and vehicular body and frame assembly comprising the steps of:

(a) providing four hollow members including a front end member having a pair of rearwardly extending protrusions, a rear end member having a pair of forwardly extending protrusions, a left side member having a front end and a rear end, and a right side member having a front end and a rear end, at least two of the four hollow members being formed from differing materials;

(b) forming the four hollow members into predetermined shapes;

(c) disposing the front ends of the left and right side members in a telescoping relationship with the rearwardly extending protrusions on the front end member and the rear ends of the left and right side members in a telescoping relationship with the forwardly extending protrusions on the rear end member;

(d) securing the telescoping portions of the four hollow members together to form an engine cradle;

(e) providing a vehicular body and frame assembly; and

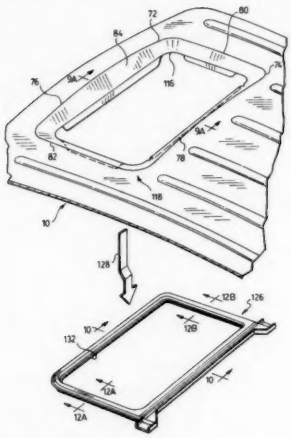
(f) securing portions of the engine cradle to portions of the vehicular body and frame assembly to form a combined engine cradle and vehicular body and frame assembly.

US 6,408,516 B1

SUNROOF OPENING FOR VEHICLE ROOF PANEL

Joe E. Taylor, Troy, Mich., assignor to Shiloh Industries, Inc. Dickson Mfg. Div., Dickson, Tenn.

Filed Aug. 30, 1999, Appl. No. 385,314
Int. Cl. B21D *53/88*
U.S. Cl. 29—897.2 **6 Claims**



1. In a method for stamping and punching at several stations an opening in a vehicle roof panel for a sunroof installation, the initial operation of stamping a preform recess in a top section of said panel to define a perimeter for a sunroof opening, said initial operation comprising:

i) locating said roof panel in a stamping press beneath a press die, said panel being fixed relative to said die to align die perimeter with a predetermined position for said sunroof opening perimeter in said roof panel;

ii) stamping said preform recess in said roof panel to provide said perimeter for a sunroof opening, said preform being characterized by having a first bend which defines said opening perimeter comprising rounded corner portions interconnecting a front edge, a rear edge and two side edges, a downwardly extending flange which becomes a sidewall of said sunroof opening, said flange extending for a length at least equal to a depth of a seal portion of sunroof panel perimeter and a second bend extending opposite to said first bend for interconnecting said flange to base plate portion of said recess, said flange sloping at an angle from said first bend toward said base plate, and

iii) at subsequent stations using an underside surface of said sloping flange to locate said panel for further processing.

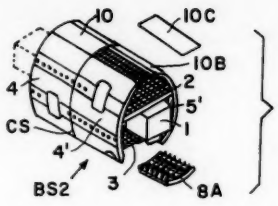
US 6,408,517 B1

METHOD AND APPARATUS FOR ASSEMBLING A THREE-DIMENSIONAL STRUCTURAL COMPONENT

Joachim Lehmker, Lunestedt; Karl-Heinz Muehlnickel, Jork; Udo-Henning Stoewer, Bremen, and Ruediger Vollmerhaus, Hamburg, all of Germany, assignors to Airbus Deutschland GmbH, Hamburg, Germany

Filed Jun. 26, 2000, Appl. No. 603,870
Claims priority, application Germany, Jun. 26, 1999, 199 29 471
Int. Cl. B21D *53/88*
U.S. Cl. 29—897.2 **10 Claims**

1. A method for assembling at least one body section of a large scale structural component, said body section including at least one support grid and a plurality of prefabricated wall sections including a top wall section (**10**), side wall sections (**4**, **5**), and a bottom wall section (**8**), said method comprising the following steps:



(a) prefabricating said wall sections (**4**, **5**, **8**, **10**), and said at least one support grid (**2**, **3**),

(b) mounting a central assembly core (**1**) to two end supports (**12**, **13**) for said central assembly core (**1**),

(c) releasably securing said at least one support grid (**2** or **3**) to said central assembly core (**1**),

(d) first positioning said prefabricated side wall sections (**4**, **5**) for mounting to said at least one support grid (**2**, **3**),

(e) permanently securing said prefabricated side wall sections (**4**, **5**) to said at least one support grid,

(f) second positioning said prefabricated top wall section (**10**) and said prefabricated bottom wall section (**8**) for mounting to said prefabricated side wall sections (**4**, **5**),

(g) permanently securing said prefabricated top wall section (**10**) and said prefabricated bottom wall section (**8**) to said prefabricated side wall sections (**4**, **5**) to form at least one body section of said structural component, and

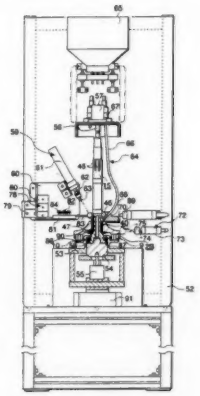
(h) removing said central assembly core from said at least one body section, whereby said at least one support grid becomes an integral part of said at least one body section of said large scale structural component and using internal and external jigs is avoided.

US 6,408,518 B1

METHOD AND APPARATUS FOR ASSEMBLING BALLS FORMING BALL SPLINE OF TOROIDAL-TYPE CONTINUOUSLY VARIABLE TRANSMISSION

Mitsuo Kumagae, Saitama, and Ryota Iwahashi, Kanagawa, both of Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Oct. 27, 2000, Appl. No. 697,649
Claims priority, application Japan, Oct. 28, 1999, 11-306931
Int. Cl. B21D *53/10;* **F16H** *15/38*
U.S. Cl. 29—898.03 **5 Claims**



1. A method for assembling balls forming a ball spline of a toroidal-type continuously variable transmission, said transmission comprising:

a rotary shaft having a plurality of outside diameter side ball spline grooves respectively formed at a plurality of circumferential-direction portions of the outer peripheral surface of the middle portion thereof, each of which extends in an axial direction thereof;

a power transmission disk supported on the periphery of the middle portion of said rotary shaft in such a manner as to be shiftable with respect to said rotary shaft only in the axial direction thereof through the ball spline, said power transmission disk having a plurality of inside diameter side ball spline grooves respectively formed at a plurality of circumferential-direction portions of the inner peripheral surface thereof such as to face said respective outside diameter side ball spline grooves, each of which extends in the axial direction thereof; and

said balls disposed in a plurality of cylindrical-shaped spaces respectively defined by and between said outside diameter side and inside diameter side ball spline grooves,

said method comprising the steps of:

assembling a member for preventing said balls from slipping out from openings formed in the respective lower end portions of said plurality of cylindrical-shaped spaces;

disposing said power transmission disk on the periphery of the middle portion of said rotary shaft disposed in the vertical direction;

matching the phases of said outside diameter side ball spline grooves and the phases of said inside diameter side ball spline grooves;

supplying a given number of balls into each of said cylindrical-shaped spaces through each of openings formed in the respective upper end portions thereof; and

after said supplying step, reciprocatingly shifting at least one of said rotary shaft and said power transmission disk with respect to each other in at least one direction of the circumferential direction thereof and the axial direction thereof, to thereby feed said given number of balls into the lower portion of each of said cylindrical-shaped spaces.

US 6,408,519 B1

METHOD FOR SECURING A BEARING IN A BEARING PLATE AND BEARING ARRANGEMENT

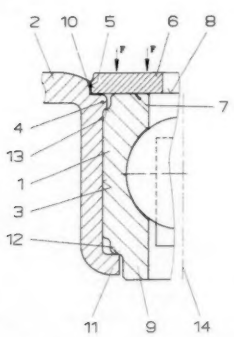
Berthold Beyfuss, Kaisten; Manfred Brandenstein, Eussenheim; Burkhard Buchheim, Schweinfurt; Helmut Hauck, Euerbach, and Peter Horling, Mainberg, all of Germany, assignors to SKF GmbH, Schweinfurt, Germany

Filed Jul. 24, 2000, Appl. No. 624,912

Claims priority, application Germany, Jul. 28, 1999, 199 35 469

Int. Cl. B21D *53/10*

U.S. Cl. 29—898.07 **10 Claims**



1. A method for securing at least one bearing in a bearing plate which possesses an indentation for receiving the bearing, comprising:

at least partially swaging at least one positioning face on the bearing plate;

positioning a bearing in the indentation before or after the partial swaging of the at least one positioning face;

positioning a retaining baffle against the at least one positioning face to cover the bearing;

material bonding the retaining baffle to the bearing plate so that during operation of the bearing the retaining baffle applies an axial force on a part of the bearing.

US 6,408,520 B1

POWER TOOL DRIVEN FRUIT AND VEGETABLE PEELER

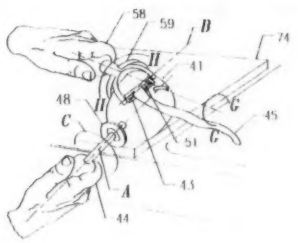
Donald G. Ridler, 149 Waterbury Ct., Westland, Mich. 48185

Division of application No. 09/028,103, filed on Feb. 23, 1998, now Pat. No. 6,082,253. This application May 19, 2000, Appl. No. 574,893.

This patent is subject to a terminal disclaimer.

Int. Cl. A23N *7/00*

U.S. Cl. 30—123.6 **16 Claims**



1. An apparatus for peeling fruits and vegetables comprising: a handle for pivotally mounting and manually controlling the motion of a peeling blade across an outer portion of a rotating fruit or vegetable for peeling away said outer portion of said fruit or said vegetable; a peeling blade having a sharp cutting edge pivotally mounted in said handle, a small hand held rotary power tool for rotating said fruit or vegetable against said sharp cutting edge of said peeling blade; and an arbor mounted in said power tool for receiving said fruit or said vegetable.

US 6,408,521 B1

HYGIENIC KITCHEN SPOON

Nina Boyles Pye, 4660 Pontchar Train Dr., Slidell, La. 70458, and T. Wilfred Pye, 304 Fairmount Dr., Hooma, La. 70360

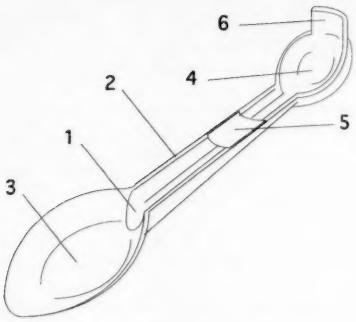
Filed Aug. 4, 2000, Appl. No. 632,978

Int. Cl. A47J *43/28*

U.S. Cl. 30—141 **17 Claims**

1. A hygienic spoon for facilitating the prevention of human oral fluids from reaching the source cuisine when the procedure of tasting occurs, comprising two spoon shaped ladle ends connected by a handle, said handle housing a channel for the entire length of said handle, with said channel emptying on both ends into said two ladle ends such that a fluid contained in either of said ladle ends may be allowed to run along said handle by the force of gravity under the control of an operator such that a portion of said fluid can be conveyed into the second of said ladle ends when initially introduced into the first of said ladle ends;

with the extreme outer lip of one of said two ladle ends extended further up into space through the two dimensional ovoid that



normally defines the upper containment lip of a spoon shaped ladle end.

US 6,408,522 B2

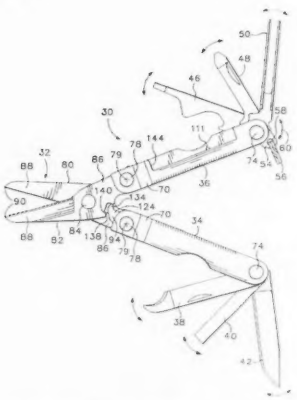
MULTIPURPOSE TOOL INCLUDING HANDLES HAVING SEPARATE SIDES

Benjamin C. Rivera, West Linn, Oreg., assignor to Leatherman Tool Group, Portland, Oreg.

Division of application No. 09/065,757, filed on Apr. 24, 1998, now Pat. No. 6,293,018, which is a continuation of application No. PCT/US96/19308, which is a continuation-in-part of application No. 08/563,922, filed on Nov. 29, 1995, now Pat. No. 5,745,997. This application Sep. 25, 2001, Appl. No. 963,262.

Int. Cl. B26B *1/00;7/22*

U.S. Cl. 30—155 **14 Claims**



1. A folding tool including a handle, comprising:

(a) a first elongate handle side having a pair of opposite ends;

(b) a second elongate handle side having a pair of opposite ends;

(c) an elongate spring located between said first and second handle sides, said spring including an anchored end and an opposite outer end;

(d) a tool blade having a base defining a pivot hole, said base being located between said first and second handle sides; and

(e) a pair of fasteners interconnecting said handle sides and holding them parallel with each other, a first one of said fasteners fastening said anchored end of said spring between said handle sides and the other of said fasteners extending through said pivot hole in said tool blade, and at least said first handle side including a flange extending longitudinally along a portion thereof and directed toward said second handle side, said flange supporting a portion of said elongate spring at a location between said anchored end and said outer end, and said outer end of said spring engaging said base of said blade.

US 6,408,523 B1

SCISSORS

Hardi Schmidt, Nümmener Strasse 70, Solingen, Germany, 42653

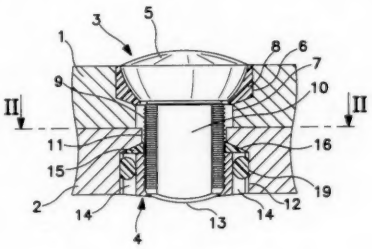
PCT No. PCT/DE97/00375, § 371 Date May 11, 1998, § 102(e) Date May 11, 1998, PCT Pub. No. WO97/38829, PCT Pub. Date Oct. 23, 1997

PCT Filed Mar. 1, 1997, Appl. No. 68,608

Claims priority, application Germany, Apr. 13, 1996, 196 14 691

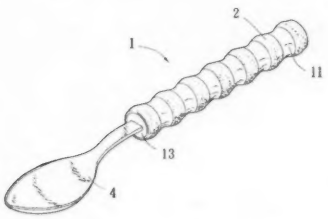
Int. Cl. B26B *13/28*

U.S. Cl. 30—254 **6 Claims**



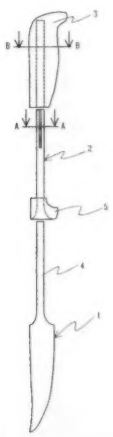
1. A pair of scissors comprising a first scissors half (**1**) and a second scissors half (**2**), said first scissors half (**1**) having a first bore (**6**, **7**), said second scissors half (**2**) having a second bore (**11**, **12**, **16**), said bores (**6**, **7**; **11**, **12**, **16**) being generally in alignment; said second bore (**11**, **12**, **16**) being defined by an opening-defining surface (**11**) adjacent said first bore (**6**, **7**), an enlarged bore-defining surface (**12**) remote from said first bore (**6**, **7**) and a transition surface (**16**) between said opening-defining surface (**11**) and said enlarged bore-defining surface (**12**); a hinge screw (**3**) having a head (**5**) substantially disposed in said first bore (**6**, **7**) and a threaded shaft (**9**) thereof disposed in said first bore (**6**, **7**) and said second bore (**11**, **12**, **16**); said threaded shaft (**9**) having an exterior peripheral surface in substantially non-rotatable matching conforming relationship to said opening defining surface (**11**) thereby effecting non-rotatable relationship therebetween, said second scissors half (**2**) including opposite first and second surfaces with the second scissors half first surface being in rotatable contact with an opposing surface of said first scissors half (**1**); a screw nut (**4**) having internal threads in threaded relationship to said threaded shaft (**9**) and an outwardly opening circumferential groove (**18**); said screw nut (**4**) being substantially housed within said enlarged bore-defining surface (**12**) and including axially spaced first and second end faces with said second end face being substantially flush with said second surface of said second scissors half (**2**); a first flexible body (**19**) being seated in said outwardly opening circumferential groove (**18**) and being in yieldable pressure contact with said enlarged bore-defining surface; and a second flexible body (**15**) being disposed in contacting relationship between said screw nut first axial end face and said transition surface (**16**) whereby said first (**19**) and second (**15**) flexible bodies cooperatively function to establish a yieldable frictional connection between the hinge screw (**3**) and the second scissors half (**2**) upon the tightening of said screw nut (**4**) upon said threaded shaft (**9**) which squeezes said second flexible body (**15**) between said screw nut first axial end face and said transition surface (**16**) thereby forcing said second flexible body (**15**) into intimate yieldable gripping contact with said thread shaft (**9**) to effectively mitize said hinge screw (**3**) and said second scissors half (**2**) and avoid jerking of the scissor halves **1**, **2** during pivotal motion when in use.

US 6,408,524 B1
TABLEWARE GRIP STRUCTURE WITH COMFORTABLE TOUCH FEELING
Yin-Chu Lai, No. 378, Pao-Bou Rd., Changhua, Taiwan
Filed Jun. 16, 2000, Appl. No. 594,728
Int. Cl. B25G *1/10*
U.S. Cl. 30—324 **7 Claims**



1. Tableware grip structure with comfortable touch feeling comprising a grip and a fitting body, a front end of the grip being disposed with a fitting section formed with a fitting slot at front end for fitting with a tableware, said tableware grip structure being characterized in that the grip is formed with multiple arch bulge sections and multiple recessed sections which are interlaced with each other, each recessed section being formed with at least one through hole, the fitting body being correspondingly fixedly fitted on the recessed sections of the grip, whereby a user's hand can more snugly hold the grip structure with a more comfortable touching feeling.

US 6,408,525 B1
KNIFE
Lauri Marttiini, Rovaniemi, Finland, assignor to J. Marttiinin Puukkotehdas Oy, Rovaniemi, Finland
Filed Sep. 28, 2000, Appl. No. 670,233
Claims priority, application Finland, Sep. 30, 1999, 992109
Int. Cl. B26B *3/00*
U.S. Cl. 30—340 **26 Claims**

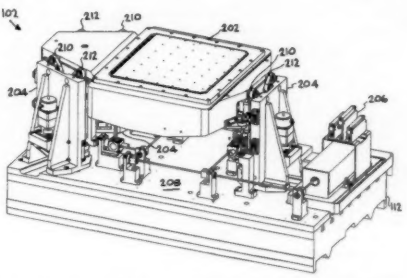


1. A knife comprising a blade with a blade tang at one end, a handle and an insert, which can be assembled by joining the insert and the blade tang, and when assembled, the insert and the blade tang are fitted into a hole in the handle, the hole in the handle having a cross-section substantially equal to the cross-section of the insert portion to be fitted within the handle, characterised in that:

at least part of the portion (**6**) of the outer surface of the insert (**2**) to be fitted within the handle (**3**) is substantially a non-smooth surface,

wherein substantially all of the non-smooth surface contacts the handle.

US 6,408,526 B1
ULTRA-PRECISION POSITIONING ASSEMBLY
Richard C. Montesanti, San Francisco; Stanley F. Locke, Livermore, and Samuel L. Thompson, Pleasanton, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.
Filed Apr. 12, 1999, Appl. No. 289,761
Int. Cl. B23Q *3/18;1/26*
U.S. Cl. 33—1 M **17 Claims**



1. An apparatus for ultra-precision positioning, comprising:

a slide base;

a slide plate coupled to the slide base so as to allow movement of the slide plate along a first geometric axis;

a ball-screw, having a center-line, coupled between the slide base and the slide plate, for displacing the slide plate with respect to the slide base along the first geometric axis;

a linking device, coupled to the slide plate, for directing a primary force vector into the center-line of the ball-screw;

wherein the linking device comprises a first link, coupled to the slide plate at a first location for directing a first portion of the primary force vector to an apex point, located along the center-line of the ball-screw;

a second link, coupled to the slide plate at a second location for directing a second portion of the primary force vector to the apex point;

wherein each of the links include a link body having a first end and a second end;

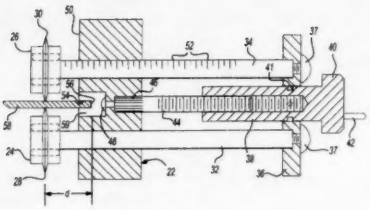
a first self-aligning bearing coupled to the first end of the link body; and

a second self-aligning bearing coupling the second end of the link body to the slide plate.

US 6,408,527 B1
SCORING TOOL
Arthur Chubb, Romulus, Mich., assignor to Tapco International Corporation, Plymouth, Mich.
Filed Aug. 11, 1998, Appl. No. 132,583
Int. Cl. B31B *1/25*
U.S. Cl. 33—42 **15 Claims**

1. A scoring tool for scoring a sheet of substantially rigid material having a thickness, said scoring tool comprising:

a body defining a longitudinal groove in one side thereof, said groove of a predefined width at least equal to the material thickness for receiving an edge of the material, and further wherein said groove is defined by an insert received by said body, said insert readily removable and replaceable with a second insert having a groove of a different width for receiving a material sheet of a corresponding different thickness; and



at least two scoring members supported by said body in fixed vertical registration one with the other, said scoring members laterally disposed from said one side of said body, and further wherein at least a first of said scoring members includes a ridge for scoring the material and defining with a second of said scoring members a gap no greater than said width of said groove and substantially aligned therewith.

US 6,408,528 B1

METHOD AND APPARATUS FOR DETERMINING THE IMPRESSING DEPTH OF A TIRE ON A MOTOR VEHICLE DISK WHEEL

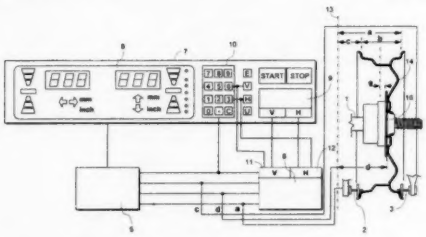
Ulrich Diez, Reichshof, Germany, assignor to Hofmann Werkstatt-Technik GmbH, Pfungstadt, Germany

Filed Feb. 12, 1999, Appl. No. 248,990

Claims priority, application Germany, Feb. 12, 1998, 198 05 779

Int. Cl. G01B *11/26;5/20;* **G01D** *21/00*

U.S. Cl. 33—203.12 **10 Claims**



6. An apparatus for determining an impressing depth of a tire on a motor vehicle disk wheel, comprising:

a balancing machine having

a main shaft on which the disk wheel is arranged,

an abutment surface that is fixed to the main shaft, and against which a hub mounting surface of a disk portion of the disk wheel is borne,

a reference plane defined on said balancing machine,

means for ascertaining a distance from said abutment surface to said reference plane,

sensing means for measuring axial distances of outward and inward measuring points of a rim of said disk wheel from said reference plane,

means for ascertaining a width of said rim of the disk wheel;

a computer in communication with said balancing machine, the computer using the width of the rim of the disk wheel and said distances from said abutment surface and from the outward and inward measuring points of the rim to said reference plane of the balancing machine to determine the impressing depth in accordance with one of two formulae that follow:

$$E=d-b/2-c;$$

and

$$E=d+b/2-a;$$

wherein

E=the impressing depth;

d=the ascertained distance from the abutment surface to the reference plane of the wheel balancing machine;

b=the width of the rim;

a=the measured distance from the outward measuring point of the rim to the reference plane of the wheel balancing machine; and

c=the measured distance from the inward measuring point of the rim to the reference plane of the wheel balancing machine.

US 6,408,529 B1

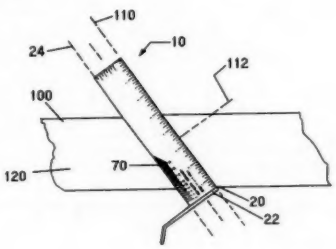
MULTI-PURPOSE FRAMING SQUARE

Sammie Rayfield Hodges, 3005 Landing Cir., Grimesland, N.C. 27837

Filed Jun. 7, 1999, Appl. No. 327,270

Int. Cl. B43L *13/00*

U.S. Cl. 33—429 **8 Claims**



1. A multi-purpose framing square for dimensional lumber comprising:

an elongate rectangular body having parallel inner and outer longitudinal sides, parallel top and bottom surfaces, and parallel planar faces, the width between said longitudinal sides corresponding to a standard width of the dimensional lumber;

a cross member attached transversely to said bottom surface of said body, said cross bar having a width greater than the distance between said planar faces and having a proximate end terminating at said outer longitudinal surface of said body and a distal end extending beyond said inner longitudinal surface of said body, the inner edge of said proximate end establishing a pivot point for rotating said body member relative to said dimensioned lumber; first indicia means on at least one of said planar surfaces adjacent said inner longitudinal surfaces in the form of radial lines having said pivot point as an origin and incrementally spaced according to common pitches for said dimensional lumber for establishing a desired angularity between said longitudinal surfaces of said body and said dimensional lumber; second indicia means on said planar surfaces adjacent one of said longitudinal surfaces of said body and incrementally spaced therealong for establishing point to point distances on said dimensional lumber; and third indicia means on said planar faces adjacent said top ends of said body incrementally spaced therealong for establishing point to point distances on said dimensional lumber.

US 6,408,530 B1

COORDINATE MEASURING INSTRUMENT OR MACHINING EQUIPMENT

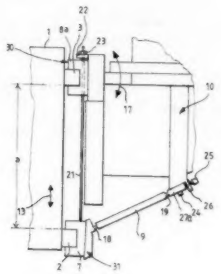
Berthold Matzkovits, Gerstetten, and Klaus-Dieter Götz, Sersheim, both of Germany, assignors to Carl-Zeiss-Stiftung, Germany

Filed Sep. 1, 1998, Appl. No. 145,390

Claims priority, application Germany, Jan. 9, 1997, 197 38 099

Int. Cl. G01B *7/008;5/008*

U.S. Cl. 33—503 **7 Claims**



1. An improved co-ordinate measuring instrument having a sensing head to measure a work piece; said sensing head being attached to a measuring arm that in turn is moveably guided on a cross slide mounted on a measuring table of the coordinate measuring instrument in a linear direction, the improvement comprising said cross slide being moveably guided on a component mounted movable on two guides, attached parallel to one another on the measuring table said component being mounted at one end on a component foot for movement on said two guides, wherein said component foot comprises an extension arm that is mounted movably with respect to said component by at least one joint and is supported on a first guide of said two guides, and wherein said component foot is rotatably mounted on a second guide of said two guides, such that on altering the distance between said two guides said component is rotated in a plane lying orthogonal to the direction of motion of said component on said two guides, so that alignment of said component changes.

US 6,408,531 B1

METHOD AND APPARATUS FOR ASSEMBLING RIGID PARTS

Joseph M. Schimmels, Milwaukee, Wis., assignor to Mechsys, L.L.C., Milwaukee, Wis.

Filed Jan. 20, 2000, Appl. No. 488,126

Int. Cl. B23Q *3/18*

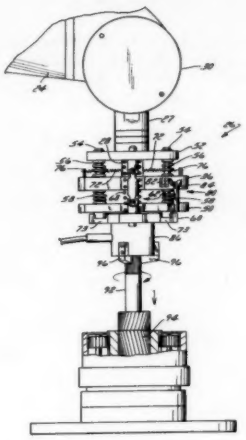
U.S. Cl. 33—644 **13 Claims**

1. A low-stiffness assemble assist mechanism for inserting a part into an assembly comprising:

a mounting element that is configured for connection to a controller; and

an output element that is connected to said mounting element at one end, and that is connected to a tool holder at a second end opposite said first end, wherein the tool holder receives the part that is to be inserted into the assembly,

wherein said assembly assist mechanism lacks any powered actuators that translate said output element relative to said mounting element, wherein said output element is passively movable along a z axis relative to said mounting element in order to insert the part into the assembly, and wherein said



movement in the z direction is independent of rotational movement of said out put element about the z axis.

US 6,408,532 B1

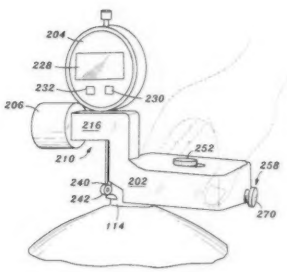
S-GAUGE

James R. Keys, Concord, and David L. Shockley, Pleasanton, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Nov. 1, 2000, Appl. No. 704,460

Int. Cl. G01B *5/00*

U.S. Cl. 33—833 **19 Claims**



1. A measuring device for measuring the thread start distance of a thread formed on an outer surface of a first container finish, comprising:

a base comprising a first surface for receiving a rim of the first container finish;

a support member movably attached to the base and adjacent the first surface, a side surface of the support member being in contact with the first container finish;

a gauge attached to the base; and

a gauge actuator operatively associated with the gauge, the gauge actuator measures a distance between the rim of the first container finish and a thread start point of the thread of the first container finish as the gauge actuator moves along an upper base line of the thread.

US 6,408,533 B2

HAIR DRYER

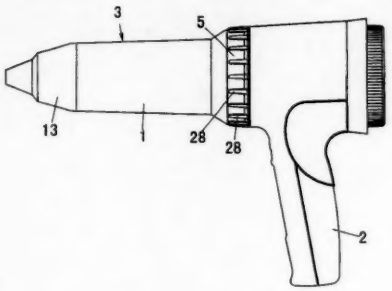
Toshihiro Sakamoto, Hong Kong, China, assignor to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed Feb. 1, 2001, Appl. No. 774,702

Claims priority, application Japan, Feb. 1, 2000, 2000-023780

Int. Cl. A45D *20/10*

U.S. Cl. 34—97 **16 Claims**



1. A hair dryer comprising:

a main body having an air outlet and an outer surface;

a heater encased in said main body and configured to heat the air;

a fan provided in said main body and configured to blow air toward the heater;

a handle attached to said main body; and

a temperature control device configured to control said heater to adjust a temperature of the air and having a temperature adjuster provided on said outer surface of said main body between the air outlet and the fan, said temperature adjuster being configured to rotate around said outer surface of said main body to adjust the temperature of the air.

US 6,408,534 B1

STEAM BOX

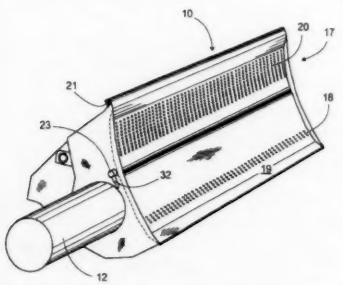
Jukka-Pekka Alen, Jyväskylä; Reijo Hassinen, Leppävesi; Tapio Härkönen, Vaajakoski; Tommi Luosma, Jyväskylä; Tuomas Näätänen, Jyväskylä, and Jukka Samppala, Jyväskylä, all of Finland, assignors to Metso Paper Automation Oy, Tampere, Finland

Filed Aug. 23, 2000, Appl. No. 644,951

Claims priority, application Finland, Sep. 6, 1999, 990372 U

Int. Cl. D06F *58/00*

U.S. Cl. 34—114 **10 Claims**



1. A steam box for heating a web, which includes an elongated steam-distribution chamber as a first row disposed transverse to the web, regulator chambers as a next row disposed transverse to the web and covered on one side with a continuous perforated screen on a web-side edge of the steam box, and operating devices to distribute the steam from the distribution chamber to each regulator chamber, and which steam box is operative to feed steam through the perforated screen to the web, to heat it according to the desired profile, characterized in that the said perforated screen is secured along one long edge disposed transverse to the web to hinge members and along an opposite edge to locking members and arranged so that said perforated screen can be swung open outwardly about said hinge members to permit access to the regulator chambers.

US 6,408,535 B1

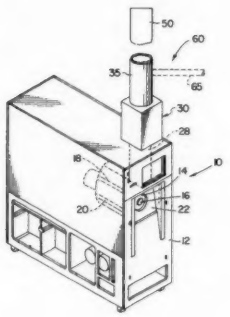
OZONE CONVERSION IN SEMICONDUCTOR MANUFACTURING

Ralph Wayne Thomas, Kalispell, Mont., assignor to Semitool, Inc., Kalispell, Mont.

Filed Aug. 26, 1999, Appl. No. 384,077

Int. Cl. F26B *21/00*

U.S. Cl. 34—275 **17 Claims**



1. A machine for processing semiconductor articles, comprising:

a processing chamber having a rotor for holding one or more semiconductor articles;

an ozone source connected to the processing chamber;

an ozone remover connected to the processing chamber by an exhaust duct, said ozone remover comprising a light chamber having an inlet coupled to the exhaust duct, an outlet, and an ultraviolet light source providing ultraviolet light into the light chamber; and

a facility exhaust duct connected to the ozone remover.

US 6,408,536 B1

PROCESS FOR DRYING PROTEIN CRYSTALS

Rolf Deusser, Sulzbach; Peter Kraemer, Eschborn, and Horst Thurow, Kelkheim, all of Germany, assignors to Aventis Pharma Deutschland GmbH, Frankfurt am Main, Germany

Filed Jan. 13, 2000, Appl. No. 482,117

Claims priority, application Germany, Jan. 27, 1999, 199 03 125

Int. Cl. F26B *5/08*

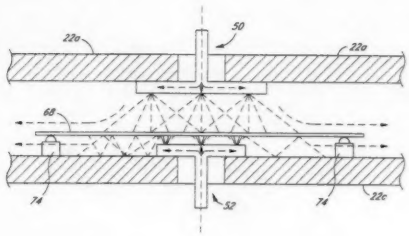
U.S. Cl. 34—312 **17 Claims**

1. A process for drying protein crystals comprising drying an aqueous protein crystal suspension in a centrifugal dryer

wherein the protein crystals are dried to a residual water content between 1 and 7%; and

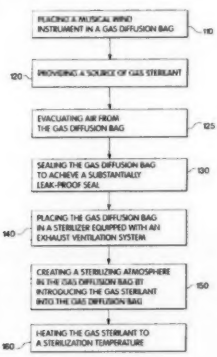
wherein the protein crystals are crystals of a protein selected from the group consisting of animal insulin, human insulin and an analog thereof.

US 6,408,537 B1
SUBSTRATE COOLING SYSTEM
Thomas W. Aswad, Phoenix, Ariz., assignor to ASM America, Inc., Phoenix, Ariz.
Continuation of application No. 09/110,544, filed on Jul. 6, 1998, Provisional application No. 60/052,263, filed on Jul. 11, 1997. This application May 30, 2000, Appl. No. 583,059.
Int. Cl. F26B *3/00;* **B65G** *49/07*
U.S. Cl. 34—380 **17 Claims**



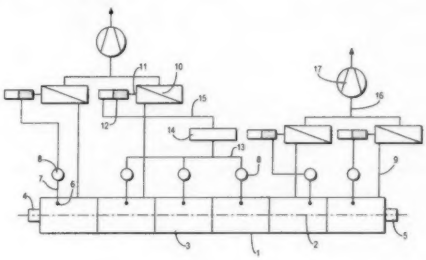
1. A method of cooling semiconductor substrates subjected to high temperatures comprising:
withdrawing a hot substrate from a process chamber;
positioning the hot substrate on a support between two opposing showerheads;
spraying inert coolant from the showerheads onto opposite sides of the substrate; and
removing the substrate from the support to a storage area.

US 6,408,538 B1
METHOD OF STERILIZATION OF MUSICAL WIND INSTRUMENTS
Lorenzo Lepore, 117 Whitney Rd., Medford, Mass. 02155
Continuation-in-part of application No. 09/635,342, filed on Aug. 9, 2000, now Pat. No. 6,345,449, Provisional application No. 60/147,887, filed on Aug. 9, 1999. This application Sep. 14, 2001, Appl. No. 953,340.
Int. Cl. F26B *7/00*
U.S. Cl. 34—389 **22 Claims**


PLACING A MUSICAL WIND INSTRUMENT IN A GAS DIFFUSION BAG
110
PROVIDING A SOURCE OF GAS STERILANT
120
EVACUATING AIR FROM THE GAS DIFFUSION BAG
125
SEALING THE GAS DIFFUSION BAG TO ACHIEVE A SUBSTANTIALLY LEAK-PROOF SEAL
130
PLACING THE GAS DIFFUSION BAG IN A STERILIZER EQUIPPED WITH AN EXHAUST VENTILATION SYSTEM
140
CREATING A STERILIZING ATMOSPHERE IN THE GAS DIFFUSION BAG BY INTRODUCING THE GAS STERILANT INTO THE GAS DIFFUSION BAG
150
HEATING THE GAS STERILANT TO A STERILIZATION TEMPERATURE
160

1. A method of sterilizing an item, wherein the item is one of a musical instrument and a musical instrument accessory, using a gas diffusion process, comprising steps of:
providing an open, sealable diffusion bag to contain the item;
placing the item into an interior of the open diffusion bag;
evacuating air from the diffusion bag;
sealing the diffusion bag;
positioning the diffusion bag in a chamber of a sterilizer having a ventilation system for removal of exhaust gas from the chamber;
providing a sterilizing atmosphere in the interior of the diffusion bag by releasing into the diffusion bag ethylene oxide at a concentration sufficient to act as a sterilant;
heating ethylene oxide to an appropriate temperature;
maintaining the temperature of the ethylene oxide for a sufficient time to sterilize the item; and
removing the diffusion bag from the sterilizer after the item is sterilized.

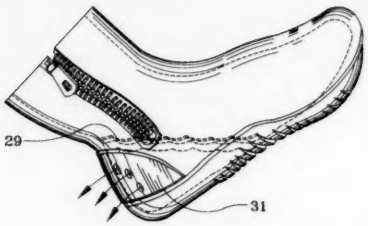
US 6,408,539 B1
METHOD OF CONTINUOUS THERMAL TREATMENT OF A TEXTILE PRODUCT WEB, AND A DRYER THEREFOR
Marc-Aurel Voth, Hamburg, and Andreas Stroehrmann, Witzeeze, both of Germany, assignors to Babcock-Textilmaschinen GmbH, Seevetal, Germany
Filed May 26, 2000, Appl. No. 580,262
Claims priority, application Germany, Mar. 28, 1999, 199 24 704
Int. Cl. F26B *3/00*
U.S. Cl. 34—444 **15 Claims**



1. A method of continuos thermal treatment of a textile product web, comprising the steps of bringing a product web in contact with a treatment gas guided in a circulating process; introducing a product web into a steam portion having one or several steam stages in which heat steam is used as a treatment gas; introducing the product web into a steam-air portion which has one or several stages and hot steam and heated air as a treatment gas; passing the product web first through the steam portion and subsequently through the steam air portion; providing an exchange of the treatment gas between the steam stages and the stages; adjusting a relative moisture of the hot steam of the steam stages of the steam portion to the value zero; and performing the adjusting by measuring relative moistures of a first and a last steam stages and changing discharge gas quantities of the first or second steam stages and one further stage.

US 6,408,540 B1
DIVE BOOT PURGE SYSTEM
Shawn W. DeKalb, 12674 Buckwheat Ct., San Diego, Calif. 92129, and Robbert Bruins, 3581 Newland Rd., Oceanside, Calif. 92056
Filed Feb. 28, 2001, Appl. No. 796,343
Int. Cl. A43B *5/08; 7/06*
U.S. Cl. 36—8.1 **17 Claims**

1. A water purging system for a flexible diving boot, comprising:
a) a first layer of flexible material located interior said boot;
b) said first layer of flexible material having formed therethrough at least one first aperture, for passing a volume of water trapped in said boot, outward through said material;
c) a second layer of material located contiguous and on the outer side of said first layer of material; and,
d) said second layer of material, defined by opposed, inner and outer sides arranged in close, spaced-apart arrangement, hav-



ing formed there through at least one second aperture for passing a volume of water from one said side of said layer to said other side of said layer;

e) wherein said first and said second apertures each assume a first configuration, out of mutual axial alignment to create a torturous path, to prevent an influx of water into the boot therethrough, when the diver's boot is suspended underwater, and each then assume a second configuration, in substantial mutual axial alignment with each other, to allow outflow of water from the boot when the diver exits the water and walks about or places the boot in a heel-down position.

US 6,408,541 B1

WATERPROOF AND MOISTURE-PERMEABLE SHOE AND METHOD FOR MANUFACTURE THEREOF

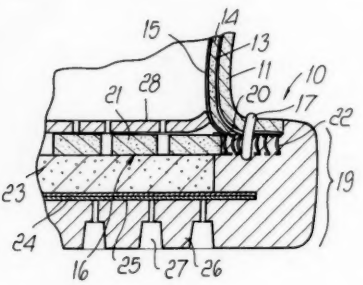
Mario Polegato Moretti, Crocetta del Montello, Italy, assignor to Nottington Holding B.V., Amsterdam, Netherlands

Filed Sep. 20, 2000, Appl. No. 666,475

Claims priority, application Italy, Sep. 21, 1999, PD99A0207; Nov. 25, 1999, PD99A0263

Int. Cl. A43B *13/28;9/10*

U.S. Cl. 36—12 **26 Claims**



1. A waterproof and moisture-permeable shoe comprising:

a moisture-permeable and waterproof upper assembly having a lower outwardly-folded edge which extends outwardly away from the inside of the shoe;

an insole having an outer peripheral component to which said lower outwardly-folded edge of said upper assembly is perimetrically connected;

a plurality of stitches which connect said lower outwardly-folded edge of said upper assembly perimetrically to said outer peripheral component of said insole;

a waterproof outsole connected below said insole; and

a waterproof sealing connecting element which is made of moisture-impermeable sealing material and which connects said lower outwardly-folded edge of said upper assembly to said outer peripheral component of said insole in at least one sealed region such as to provide a waterproof seal in said at least one sealed region.

US 6,408,542 B1

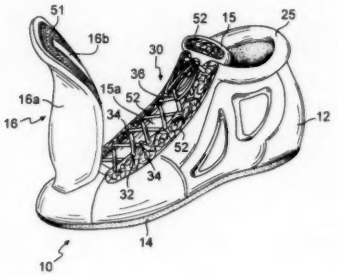
PADDED SHOE

Stephen H. Shepherd, West Palm Beach, Fla., assignor to Ringstar, Inc., New Albany, Ohio

Provisional application No. 60/165,548, filed on Nov. 15, 1999. This application Jun. 13, 2000, Appl. No. 593,256.

Int. Cl. A43B *23/26;13/14;5/00*

U.S. Cl. 36—54 **21 Claims**



1. A padded shoe, comprising:

a shoe upper adjoined to a sole, said shoe upper having padding material therein whereby the wearer can strike a target with said padded upper of said shoe and the wearer and target are protected from direct impact;

a padded tongue, said padded tongue having an inner padded tongue portion and an outer padded tongue portion, said inner and outer tongue portions each having a lower end attached to said shoe upper and a free upper end;

engagement structure on an underside of said outer tongue to secure said outer tongue portion to at least one of said inner tongue portion and said shoe upper; and

fastening structure disposed between said inner and outer tongue portions, said fastening structure being tightenable to maintain said shoe on a foot of a wearer of said shoe, whereby the wearer can strike a target with said padded tongue of said shoe and the target and the wearer are protected from direct impact with said fastening structure and said engagement structure.

US 6,408,543 B1

FOOTBED SYSTEM WITH VARIABLE SIZED HEEL CUPS

John J. Erickson, Brockton, and Douglas K. Robinson, Mansfield, both of Mass., assignors to Acushnet Company, Fairhaven, Mass.

Filed May 18, 2000, Appl. No. 573,341

Int. Cl. A43B *3/24;13/20*

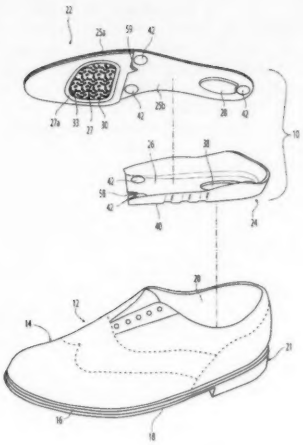
U.S. Cl. 36—100 **4 Claims**

1. A footbed system comprising:

at least one sole pad, the sole pad including a cushion having a bladder filled with discrete pieces of cushioning material, and

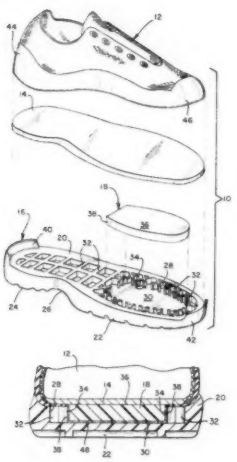
a first heel cup including a first base and a first side wall extending upwardly from the first base, the first heel cup having a first volume of the first side wall; and

a second heel cup including a second base and a second side wall extending upwardly from the second base, the second heel cup having a second volume of the second side wall, the second volume being different from the first volume,



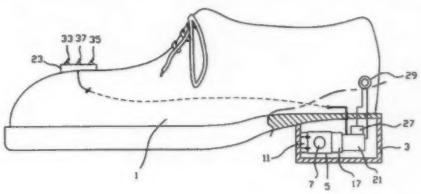
wherein one, selected heel cup is interchangeably coupled to the sole pad.

US 6,408,544 B1
FLEX SOLE
Homar Hernandez, Boca Raton, Fla., assignor to BBC International Ltd., Boca Raton, Fla.
Filed Jul. 2, 1999, Appl. No. 347,051
Int. Cl. A43B *13/18*
U.S. Cl. 36—103 **20 Claims**



1. A shoe unit comprising:
an outer sole having a peripheral wall delimiting a plantar region, a heel region, and an arch region of the outsole;
an inner cavity formed in at least one of the plantar, heel and arch regions, the cavity having a shape including a floor;
a molded-in-place cushioning pad made of ethyl vinyl acetate (EVA) located within the inner cavity, said cushioning pad having a top, bottom and side surfaces, wherein the cushioning pad is molded within the cavity prior to the assembly of a shoe upper and the outsole and
a thermal plastic rubber (TPR) layer located between the cavity and the cushioning pad to adhesively bond the bottom and side surfaces of the cushioning pad to the inner cavity so that the cushioning pad becomes an integral functional part of the outsole.

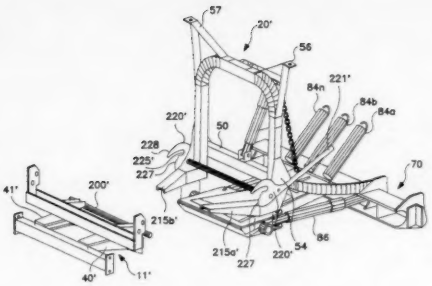
US 6,408,545 B1
LEVEL MEASURING DEVICE INSTALLED WITH GOLF SHOES
Moon Ho Song, SSangyong Apartment 1-1501 Daechi-2-dong, Kangnamku, Seoul, Rep. of Korea
Filed Oct. 16, 2000, Appl. No. 688,648
Claims priority, application Rep. of Korea, Jun. 5, 2000, 00-15939
Int. Cl. A43B *5/00;23/00*
U.S. Cl. 36—127 **4 Claims**



1. A level measuring device installed in a heel of a golf shoe comprising:
a transparent box installed inside the heel,
a ball of opaque material which rolls freely inside the box according to movement of the shoe;
first and second infrared emitting diodes for emitting infrared light from outside of the box to inside of the box wherein ball rolls;
front, back, right, and left photosensors which each outputs a signal after receiving infrared light signal from the diodes;
a microprocessor which outputs a condition signal indicating the position of the golf shoe according to a signal outputted from the photosensors;
a display device which shows the position of the golf shoe according to a signal outputted from the microprocessor;
a battery which supplies power to the first and second infrared emitting diodes and the microprocessor.

US 6,408,546 B2
VEHICLE HITCH MOUNT ASSEMBLY FOR A SNOW PLOW
Marc D. Curtis, Spencer, Mass., assignor to Curtis International, Inc., Worcester, Mass.
Continuation of application No. 09/222,448, filed on Dec. 29, 1998, now Pat. No. 6,209,231, which is a continuation-in-part of application No. 09/134,555, filed on Aug. 14, 1998, now Pat. No. 6,145,222. This application Feb. 26, 2001, Appl. No. 794,779.
Int. Cl. E01H *5/04*
U.S. Cl. 37—231 **4 Claims**

1. A vehicle mount for a vehicle having a chassis for maneuvering a utilitarian accessory relative to a substrate, comprising:
a receiver attached to a chassis of a vehicle, said receiver having first and second spaced guides and first and second spaced bars, said first bar being positioned laterally outwardly of said first guide and having a free end and said second bar being positioned laterally outwardly of said second guide and having a free end;
a frame adapted to be received by said receiver, said frame comprising first and second spaced extensions, each extension adapted to be received by a corresponding respective one of said first and second spaced guides; said frame further comprising first and second spaced pivotable latches, each of said latches having a recess shaped to receive a respective one of



said first and second spaced bars, each of said recesses having an open end, whereby when said frame is mounted to said receiver, said open end of each of said recesses does not face toward said chassis of said vehicle.

US 6,408,547 B1

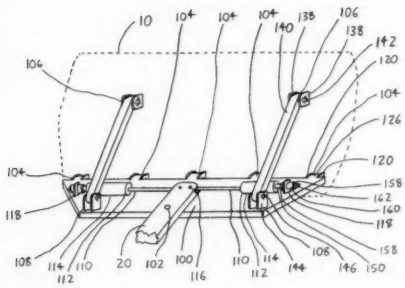
SHOCK-ABSORBENT SNOWPLOW MOUNT

Daniel K. Jones, deceased, late of Madison, by Jayson D. Jones, legal Representative; by Justine Mascari, legal representative, Sun Prairie, and Jayson D. Jones, Madison, all of Wis., assignors to Burke Truck & Equipment, Inc., Sun Prairie, Wis.

Provisional application No. 60/168,956, filed on Dec. 3, 1999. This application Dec. 1, 2000, Appl. No. 728,679.

Int. Cl. E01H *5/04*

U.S. Cl. 37—232 **20 Claims**



1. A plow comprising:

a. a vehicle mount;

b. a reversing table rotatably affixed with respect to the vehicle mount;

c. a linear actuator affixed between the vehicle mount and reversing table whereby actuation of the linear actuator causes rotation of the reversing table with respect to the vehicle mount, the linear actuator being elastically anchored to one of the vehicle mount and the reversing table;

d. a moldboard rotatably affixed with respect to the reversing table at one or more pivots, each pivot including;

(1) a bearing anchored to one of the moldboard and the reversing table, the bearing having a bearing bore;

(2) a pin anchored to the other one of the moldboard and the reversing table to which the bearing is not anchored, the pin being elastically journalled within the bearing bore so that it may translate in a radial direction therein when a radially-oriented force is exerted between the bearing and the pin.

US 6,408,548 B1

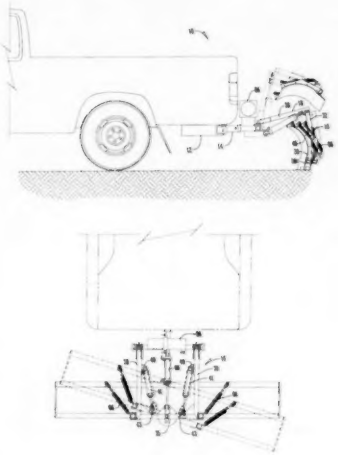
PIVOTAL REAR-MOUNTED SNOWPLOW

Charles E. Altheide, P.O. Box 78, Bloomfield, Iowa 52537

Continuation-in-part of application No. 09/224,249, filed on Dec. 30, 1998, which is a continuation-in-part of application No. 08/819,706, filed on Mar. 12, 1997, now Pat. No. 5,930,922. This application Jun. 19, 2000, Appl. No. 596,411.

Int. Cl. E01H *5/06*

U.S. Cl. 37—268 **8 Claims**



1. A snowplow, comprising:

a first frame member having a front end adapted to be mounted behind a vehicle and having a rear end;

a second frame member having an upper end pivotally connected to the rear end of the first frame member for rotation about a vertical axis and having a lower end;

a blade mounted on the lower end of the second frame member; and

a hydraulic system connected to the second frame member to control pivotal movement about a vertical axis of the second frame member and blade relative to the first frame member.

US 6,408,549 B1

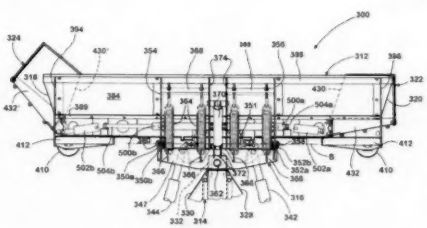
ADJUSTABLE WING PLOW

Philip J. Quenzi, Atlantic Mine; Cal G. Niemela, and Curt E. Niemela, both of Chassell, all of Mich., assignors to Blizzard Corporation, Calumet, Mich.

Filed Oct. 12, 2000, Appl. No. 689,494

Int. Cl. E01H *5/06*

U.S. Cl. 37—281 **64 Claims**



1. A plow assembly for vehicles, said assembly comprising:

a plow having first and second ends, a front material engaging surface, and a rear surface opposite said front surface;

a support for attaching said plow to the vehicle;

a plow wing on said first end of said plow, said wing having inner and outer ends, a front, material engaging surface, and rear surface opposite said front surface, said plow wing being mounted for sliding movement along said plow at said first end between a retracted position in which said outer end of said plow wing is adjacent said first end of said plow, and an extended position in which said outer wing end is spaced outwardly of said retracted position;

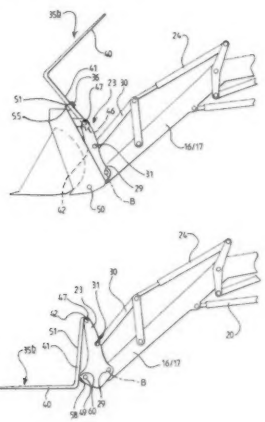
said plow wing including a hinge, said plow wing being pivotally mounted on said hinge for movement between an aligned position in which said material engaging surface of said plow wing is aligned with said front material engaging surface of said plow, and a forwardly angled position in which said wing front surface extends at an angle to said plow front surface; and

at least one actuating device connected to said plow wing which is operable to move said plow wing between said aligned position and said forwardly angled position and to move said plow wing between said retracted and said extended positions, said at least one actuating device being operable to move said plow wing between said aligned position and said forwardly angled position at least when said plow wing is in said retracted position.

US 6,408,550 B1
MOUNTING ASSEMBLY

Roy William Allsopp, Stramshall, Nr. Uttoxeter, and David John Brown, Uttoxeter, both of United Kingdom, assignors to J. C. Bamford Excavators Limited, Staffordshire, United Kingdom

Filed Jun. 21, 2000, Appl. No. 598,592
Claims priority, application United Kingdom, Jul. 2, 1999, 9915402
Int. Cl. E02F *3/96*
U.S. Cl. 37—405 **22 Claims**

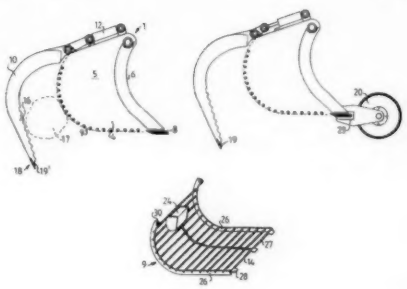


1. A mounting assembly including an arm, and a working implement mounting device provided at or towards one end of the arm, the working implement mounting device being adapted releasably to mount on the arm a first working implement, and the working implement mounting device having mounted thereon, a second working implement, the first and second working implements being independently usable, the mounting of the second working implement on the working implement mounting device enabling the second working implement to be moved relative to the working implement mounting device between a first position when the first working implement is de-mounted from the arm, and a second position, the second working implement when in the first position being usable independent of the de-mounted first working implement, and when in the second position being stowed to allow use of the first working implement, when mounted on the arm, independent of the stowed second working implement.

US 6,408,551 B1
BUCKET

Stig Pettersson, Skolgatan 3 A, S-825 31, Iggesund, Sweden

PCT No. PCT/SE97/02205, § 371 Date Jun. 29, 2000, § 102(e) Date Jun. 29, 2000, PCT Pub. No. WO99/32732, PCT Pub. Date Jul. 1, 1999
PCT Filed Dec. 19, 1997, Appl. No. 581,815
Int. Cl. E02F *3/96*
U.S. Cl. 37—409 **14 Claims**



1. A bucket assembly for mounting on a maneuvering arm comprising:

a sealing member;

transversely spaced side parts opposing said sealing member;

an edge part extending transversely between said side parts and being shaped and located to form an active edge for the bucket assembly;

a sorting part having a grid for sorting material within the bucket assembly and extending between said side parts;

said sealing member being swingable away from and toward said sorting part and said side parts between first and second positions, respectively;

said side parts, said sorting part and said sealing member in said second position thereof forming a sealed bucket defining a load space with an opening for receiving material;

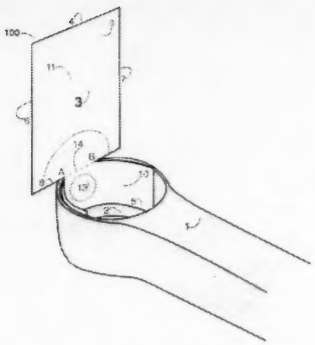
said sealing member in said first position being spaced from said sorting part enabling and exposing said sorting part for sorting material within the load space and a second position overlying the sorting part to substantially seal the bucket assembly and load space precluding passage of material through the sorting part.

US 6,408,552 B1
ADVERTISING DEVICE

Matthew Faulkner, Tujunga, Calif., assignor to Armslength Promotions, Tujanga, Calif.

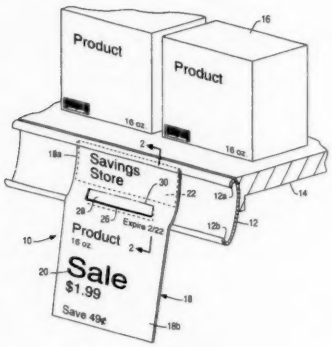
Filed Mar. 15, 2000, Appl. No. 526,165
Int. Cl. A47C *4/62*; **G09F** *7/02*
U.S. Cl. 40—320 **32 Claims**

1. An advertising device, for use in a holder, said advertising device comprising a first section and a second section, wherein said first section and said second section are attached, said second section being deformable, and said first section being capable of carrying an advertisement thereupon, wherein said first section and said deformable second section are disposed in a same plane when said deformable second section is not deformed, wherein said first section is disposed in a first plane and said second section is disposed in a plurality of planes when said deformable second section is deformed, wherein said first section contacts said deformable second section along a perforation line and a pair of cuts adjacent to said perforation line when said deformable second



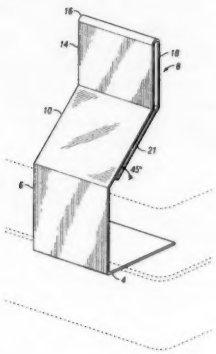
section is not deformed, and wherein said first section contacts said deformable second section along said perforation line when said deformable second section is deformed.

US 6,408,553 B1
ADHESIVE SHELF TALKER
Kevin J. Brown, Danville, Calif.; Timothy W. Rawlings, Waynesville, and Michael E. Hetrick, Dayton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed May 25, 1999, Appl. No. 318,021
This patent is subject to a terminal disclaimer.
Int. Cl. G09F *3/18*
U.S. Cl. 40—661.03 **10 Claims**



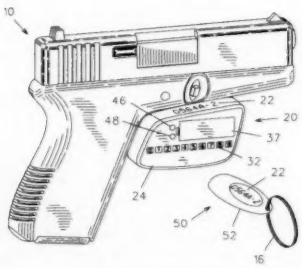
1. A shelf talker sheet for use in a printer to print product information thereon for display on a shelf bracket, comprising:
a plurality of shelf talkers arranged in a group in a common sheet for being passed through said printer to print said product information thereon;
each of said shelf talkers including a card stock label for maintaining stiffness thereof, with a top strip having adhesive on a back thereof for being adhesively mounted to said shelf bracket, and a bottom leaflet for receiving said product information printed thereon in said printer and being fully exposed for displaying said product information on said shelf bracket;
a release liner bonded to said adhesive across only said top strips, with said leaflets being linerless; and
each of said card stock labels including a die cut between said strip and leaflet extending along three edges of a rectangle to define a tab bendable about a hinge along a fourth edge of said rectangle for mounting said label to said bracket.

US 6,408,554 B1
FOUR PANEL VISUAL DISPLAY SYSTEM
Thomas S. Przylucki, 6714 Walton Heath, Houston, Tex. 77069
Filed Jul. 17, 2000, Appl. No. 617,344
Int. Cl. G09F *3/18*
U.S. Cl. 40—661.08 **5 Claims**



1. A visual display system comprising:
(b) a base;
(c) a first vertical front surface connected to said base;
(d) an angled front surface connected to said first vertical front surface having an angle of incidence from the first vertical front surface of between 10 and 40 degrees;
(e) a second vertical front surface connected to said angled front surface having a top edge;
(f) a back vertical panel secured to said top edge forming a first slot between second vertical front surface and back vertical panel for holding product information,
(g) an angled back panel connected to said back vertical panel forming a second slot between the angled front surface and the angled back panel for holding product information.

US 6,408,555 B1
ELECTRONIC TRIGGER LOCK APPARATUS AND SYSTEM
Franco Sapia, 9 Wright Rd., Derry, N.H. 03038, and Thomas B. Brundage, P.O. Box 418, Ottawa, Kans. 66067
Filed Sep. 7, 2000, Appl. No. 656,937
Int. Cl. F41A *17/00*
U.S. Cl. 42—70.07 **10 Claims**



1. An electronic trigger lock for preventing unauthorized access to a trigger of a firearm, comprising:
a housing having a first section and a second section, said first section defining an interior space;
means for releasably coupling said second section to said first section of said housing;
a token having a token body and at least one ferro-magnetic wire disposed in said token body;

a read head disposed in said interior space of said first section and adapted to generate a plurality of output pulses in response to a switch in magnetic state of said at least one ferro-magnetic wire of said token upon said token being proximately aligned with said read head;

a processor mounted in said interior space and coupled to said read head for receiving said plurality of output pulses, said processor adapted to calculate an actual value representing the number and duration of said plurality of output pulses and to compare said actual value with a predetermined value, said processor adapted to deliver a signal to said coupling means when said actual value matches said predetermined value so as to release said second section from said first section;

a numeric keypad disposed on said housing for receiving a manually input personal identification number from a user; and

comparator circuitry disposed within said interior space of said first section and coupled to said keypad for comparing said personal identification number with a predetermined access number, said comparator circuitry adapted to energize said read head when said personal identification number matches said access number.

US 6,408,556 B1

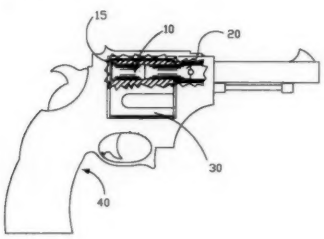
BREECH BLOCK FIREARM SAFETY DEVICE

John D. Achee, 134 Belmont Dr., and Richard L. Zaharek, 105 Highfield Dr., both of Torrington, Conn. 06790

Filed Aug. 16, 2001, Appl. No. 931,426

Int. Cl. F41A *17/00*

U.S. Cl. 42—70.11 **4 Claims**



1. A breech block firearm safety device in combination with a fire arm having a breech, a barrel having a breech end and a bore end, said firearm having a caliber, an action, a cartridge extractor, an ejection mechanism having specific ejection clearance dimensions, the breech block firearm safety device comprising:

a) a solid one piece single casing breech member, having a breech end and a bore end, for insertion into said breech and preventing unintentional loading of said firearm, said breech member having the same outside dimensions and configuration as a single casing of said firearm caliber ammunition, and having said bore end tapped to accept an attaching means;

b) a solid cylindrical bore member having a breech end and a bore end, said breech end fitted with said attaching means for attaching said bore member to said breech member, said bore member having a diameter slightly less than the diameter of said barrel, and having sufficient length to produce an assembled breech block firearm safety device longer than said ejection clearance.

US 6,408,557 B1

APPARATUS FOR PRODUCING RIFLING GROOVES IN A WEAPON BARREL

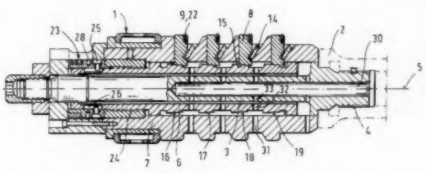
Manfred Zaeper, Unterlüss, and Klaus Hogrebe, Hermannsburg, both of Germany, assignors to Rheinmetall W & M GmbH, Unterlüss, Germany

Filed Sep. 18, 2000, Appl. No. 663,922

Claims priority, application Germany, Sep. 16, 1999, 199 44 378

Int. Cl. B23C *3/32*

U.S. Cl. 42—76.1 **6 Claims**



1. A drawing head for producing rifling grooves in a weapon barrel, in that the drawing head is rotated about its longitudinal axis and is drawn through the respective weapon barrel by a drawing rod connected to one end of the drawing head, and the rifling grooves are cut into the inside surface of the weapon barrel with corresponding drawing knives disposed on the circumferential surface of the drawing head; said drawing, head comprising: a central fastening arbor that can be connected at one end to the drawing rod, an adjusting arbor that is mounted and surrounds a circumference of the fastening arbor in at least a partial region, and is displaceable in a direction of the longitudinal axis of the drawing head, and a carrier member that surrounds the circumference of the adjusting arbor in at least a partial region, and in which holders that receive the drawing knives are disposed; and wherein

the holders are disposed in the carrier member for displacement radially outwardly, counter to the pressure of a spring, and are supported on their end facing the adjusting arbor by slanted end surfaces that rest on corresponding, conical regions of the adjusting arbor such that the axial displacement of the adjusting arbor effects the radial displacement of the holders, and thus of the drawing knives; and

the holders are distributed in at least two axially spaced annular regions about the circumference of the carrier member.

US 6,408,558 B1

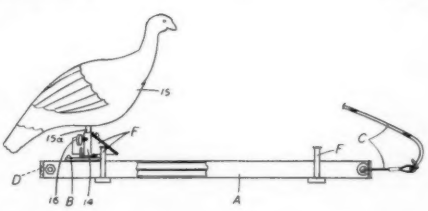
APPARATUS AND METHOD FOR IMPARTING A TRAVERSING MOTION TO A TURKEY DECOY

Richard J. Cornell, Jr., 114 Woodside Dr., Honea Path, S.C. 29654, and David T. Hamby, Anderson, S.C., assignors to Richard J. Cornell, Jr., Honea Path, S.C.

Filed Nov. 6, 2000, Appl. No. 706,892

Int. Cl. A01M *31/06*

U.S. Cl. 43—2 **17 Claims**



1. Apparatus for imparting a traversing motion to a turkey decoy comprising:

an elongated trackway positionable on the ground;

a decoy carrier slidably mounted on the trackway for movement in a path traversing the trackway;

a spring connected to the decoy carrier and to the trackway; and

a linear connector positionable between a hunter and the decoy carrier for manually pulling the decoy carrier along the trackway against the force of the spring thereby developing tension in the spring;

whereby the decoy carrier is pulled in one direction on the trackway and returned in an opposite direction by the tension developed in the spring.

US 6,408,559 B2

ANIMATED WATERFOWL DECOY APPARATUS

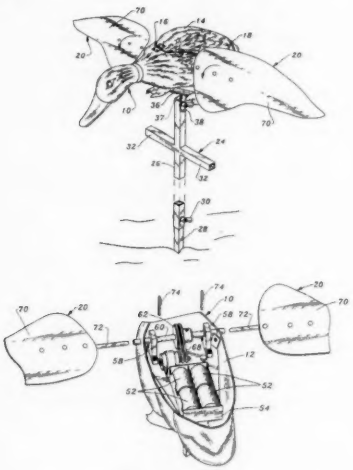
Robert Mathews, 8800 Mathews La., Marysville, Calif. 95901

Continuation of application No. 09/273,875, filed on Mar. 22, 1999, now Pat. No. 6,170,188. This application Dec. 12, 2000, Appl. No. 737,330.

This patent is subject to a terminal disclaimer.

Int. Cl. A01M *31/06*

U.S. Cl. 43—3 **39 Claims**



1. An animated bird replica apparatus employable as a decoy, said apparatus comprising:

a housing having the configuration of a bird's body having a housing top simulating a bird body top, a head end, said head end resembling a head of a bird, a tail end, and a longitudinal axis extending between said head end and said tail end, said housing defining a housing interior, and

a pair of bird wing members rotatably connected to said housing between said head end and said tail end, said pair of bird wing members extending outwardly from opposed sides of said housing laterally of said longitudinal axis and fully rotatable around a common axis, said pair of bird wing members further resembling a pair of extended bird wings,

an elongated support stand connected to said housing, said support stand extending downwardly from said housing, said support stand having a lower distal end for anchoring in the earth under a body of water and having adequate length to support said housing sufficiently above the surface of a body of water such that said bird wing members are out of contact with the water, but close enough to the surface of the water such that said housing and said bird wing members simulate a bird in flight near a surface of a body of water with wings extended as though about to land.

US 6,408,560 B1

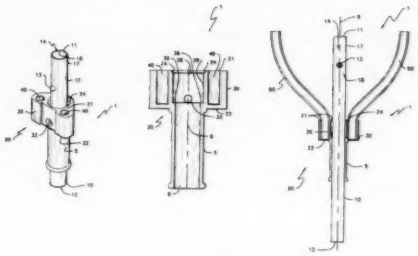
FISH NET HANDLE GUIDE AND LOCKING APPARATUS

John Bloom, Box 3103, Union Gap, Wash. 98903

Filed Oct. 20, 2000, Appl. No. 693,476

Int. Cl. A01K *77/00*

U.S. Cl. 43—12 **12 Claims**



1. A fish net handle guide and locking apparatus comprising:

a) locking assembly (**20**) comprising a handle guide (**5**) having a handle guide aperture (**8**), a handle guide longitudinal axis (**9**) centrally positioned at the handle guide aperture (**8**); a locating counterbore (**28**) concentrically positioned relative to the handle guide longitudinal axis (**9**); a handle (**10**) having a first and a second end (**11**, **12**); the handle guide aperture (**8**) receiving the handle (**10**); the handle (**10**) concentrically positioned relative to the handle guide longitudinal axis (**9**); the locking assembly (**20**) having a chamfer (**24**) proximal the locating counterbore (**28**) proximal the handle (**10**); the handle first end (**11**) proximal the chamfer when the handle (**10**) is extended; a locating shoulder (**36**) at the locating counterbore (**28**) distal from the chamfer;

b) at least one locking pin assembly (**14**) fixed by fixing means proximal the handle first end (**11**) from a handle inside to a handle outside (**18**, **17**); the at least one locking pin assembly (**14**) having a locking pin (**13**) biased by spring means to be extended away from the handle outside (**17**); the locking pin (**13**) generally orthogonal to the handle outside (**17**) and to the handle guide longitudinal axis (**9**); the locating shoulder (**36**) proximal the handle second end **12**) when the handle is collapsed; the locating shoulder (**36**) dimensioned to obstruct extending movement of the locking pin (**13**) and handle (**10**) when the handle (**10**) is extended;

c) at least one locking aperture (**32**) in the locking assembly (**20**); the locking aperture (**32**) generally orthogonal to the handle guide longitudinal axis (**9**); the locking aperture (**32**) proximal the locating shoulder (**36**) and sized to receive the locking pin (**13**);

d) one or a plurality of net frame apertures (**40**) to receive net frame means (**60**); and wherein when the handle is moved from a collapsed position to an extended position along the handle guide longitudinal axis, the locking pin engages the chamfer and then engages the locating shoulder to thereby obstruct any further extending movement of the handle.

US 6,408,561 B1

FISHING ALARM AND LIGHTING APPARATUS

Dwaine L. Winter, Staples, Minn., assignor to Carole A. Winter, Staples, Minn.

Filed Sep. 7, 2000, Appl. No. 656,929

Int. Cl. A01K *97/12*

U.S. Cl. 43—17.5 **7 Claims**

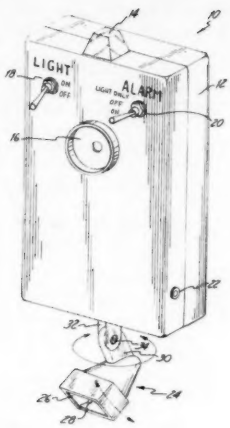
1. A fishing alarm and lighting apparatus comprising:

a portable housing;

an electrical circuit contained within the portable housing;

a power source contained within the portable housing;

a fish strike detector that causes the electrical circuit to be completed when a fish strike is detected;



an alarm, including a signal light, that is triggered when the electrical circuit is completed;

a utility light fixed to the housing, separate from the alarm and capable of simultaneous use with the alarm.

US 6,408,562 B1

INTRA-LINE FISHING ROD

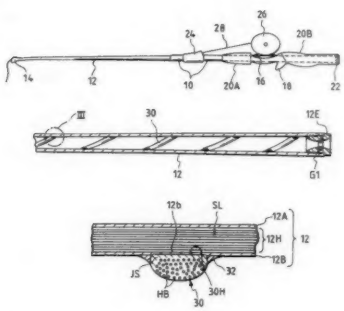
Shunji Sunaga; Shoichi Koganei; Masaru Akiba, all of Tokyo; Tomoyoshi Tsurufuji, Saitama; Yutaka Kurano, Tokyo; Toyoaki Takimoto, Tokyo, and Toshihiro Kurokawa, Tokyo, all of Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan

Filed Nov. 16, 1995, Appl. No. 558,661

Claims priority, application Japan, Nov. 16, 1994, 6-306930; Mar. 10, 1995, 7-079913; May 10, 1995, 7-135992; May 19, 1995, 7-145259

Int. Cl. A01K *87/04*

U.S. Cl. 43—24 **23 Claims**



1. An intra-line fishing rod having a passageway extending along a longitudinal axis for passing a fishline through an interior of said fishing rod, said fishing rod comprising:

a rod tube comprising a synthetic resin as a matrix and reinforced by reinforced fibers, said rod tube having inner and outer surfaces extending along the longitudinal axis, said inner surface defining said passageway for passing said fishline through said interior said fishing rod;

a fishline guide for guiding said fishline within said rod tube along said longitudinal axis, said fishline guide projecting from the inner surface of said rod tube and said fishline guide being connected integrally to said rod tube as a consequence of thermal molding of the rod tube, said fishline guide having an outer peripheral surface abutting the inner surface of said rod tube between a front and rear side of said fishline guide; and

a cushioning means formed respectively at said front and said rear side of said fishline guide to form a connection between said rod tube and said fishline guide so as to reduce stress concentration when said rod tube is flexed.

US 6,408,563 B1

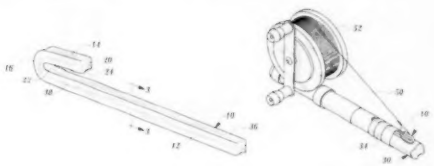
FISHING POLE ATTACHMENT FOR RETAINING FISHING LINE

Schuyler Allen Van Scoy, 201 Paseo Arboles, Suisun, Calif. 94585

Filed May 23, 2000, Appl. No. 576,017

Int. Cl. A01K *97/06*

U.S. Cl. 43—25.2 **1 Claim**



1. In combination:

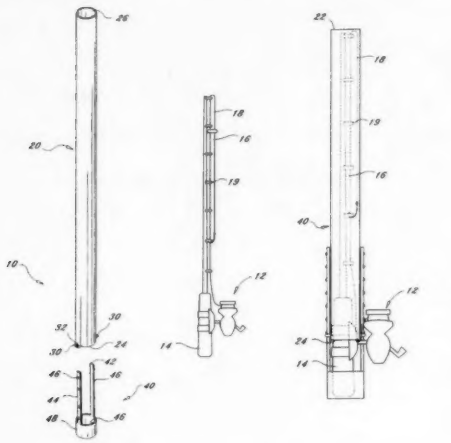
a fishing pole;

a fishing reel attached to the fishing pole, said fishing reel having fishing line wound thereabout and extending therefrom;

a line holder attached to said fishing pole adjacent to said fishing reel for releasably retaining said fishing line at a fixed location on said fishing pole adjacent to said fishing reel; and

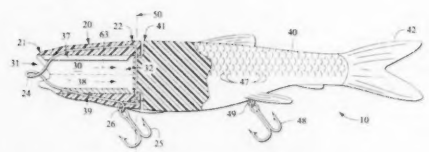
securement means securing said line holder to said fishing pole, said line holder being of integral construction and including a double-ended, straight, elongated first holder portion and a second holder portion attached to one of the ends of said straight, elongated holder portion, said second holder portion defining a bend and doubling back along and adjacent to said first holder portion, said second holder portion having a free second holder portion end spaced from the location of attachment of said first holder portion and said second holder portion, said first holder portion and said second holder portion defining a recess therebetween for receiving said fishing line or a hook connected to said fishing line, and said first holder portion and said second holder portion end defining an opening communicating with said recess whereby said recess is open, said first holder portion having first and second segments disposed end to end with said second segment being flexible and directly connected to said second holder portion, said securement means securing the first segment of said first holder portion in fixed position on said fishing pole and immovable with respect thereto, and said second segment of said first holder portion being in engagement with said fishing pole when in unflexed condition to exert opposed resilient clamping forces on fishing line disposed between said second segment of said first holder portion and said fishing pole to releasably secure the fishing line between said second segment of said first holder portion and said fishing pole, and said second segment of said first holder portion flexing relative to the first segment of said first holder portion and away from said fishing pole upon application of an outside force thereto, said first holder portion having a plurality of concavely curved surfaces with a curved pole engagement surface, the concave curvature said curved pole engagement surface generally corresponding to the curvature of said fishing pole at the location of said first holder portion.

US 6,408,564 B1
FISHING ROD COVER SYSTEM
Robert E. Murphy, 625 Spring St., P.O. Box 192, Clearwater, Minn. 55320-0192
Filed Jul. 21, 2000, Appl. No. 620,837
Int. Cl. A01K *97/08*
U.S. Cl. 43—26 **5 Claims**



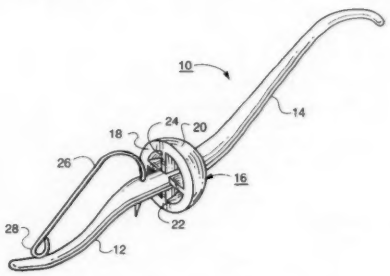
1. A fishing rod cover system, comprising:
an elongate tubular cover having a first end and a second end formed for fitting about a shaft of a fishing rod above a reel of said fishing rod, wherein said first end is open;
an attaching member formed for receiving and engaging a distal end of a handle of said fishing rod;
a plurality of elastic straps each comprising a flat structure having a first flat surface and a second flat surface wherein said first flat surface faces outwardly, and wherein said plurality of elastic straps extend from said attaching member along an axis substantially parallel to a longitudinal axis of said elongate tubular cover when the attaching member and elongate tubular cover are attached together;
a plurality of nubs extending from said first flat surface of each of said plurality of elastic straps;
a plurality of catch members secured to said first end of said elongate tubular cover for catchably receiving said plurality of elastic straps; and
a flat slot within each of said plurality of catch members for snugly receiving said plurality of elastic straps.

US 6,408,565 B1
FISH BAIT DEVICE
Franklin R. Duncan, E. 11205 4th Ave., Spokane, Wash. 99206
Filed Mar. 10, 2000, Appl. No. 523,009
Int. Cl. A01K *85/100*
U.S. Cl. 43—42.06 **1 Claim**



1. A fish-bait device for use in a fluid medium, the device comprising:
an articulated integral two-piece body comprising:
a substantially three-dimensional front portion having a first end and an opposite second end, wherein the front portion defines a substantially longitudinal duct therein;
a substantially three-dimensional rear portion having a first end, and an opposite second end, wherein the first end of the rear portion is pivotally connected about a pivot axis to the second end of the front portion;
a fluid-deflecting surface defined on the rear portion proximate the first end thereof, wherein the duct is configured to direct there through a stream of fluid medium against the fluid-deflecting surface;
a floatation device attached to the front portion and eccentrically located substantially within the duct at a given orientation; and,
a weight attached to the front portion and eccentrically located substantially within the duct at a given orientation which is substantially opposite the floatation device.

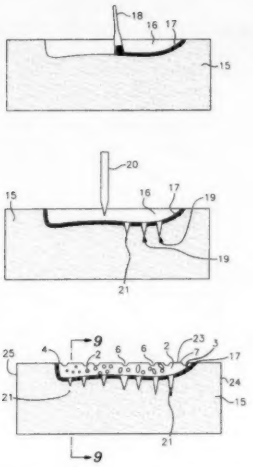
US 6,408,566 B1
FLOATING FISHING LURE
Fred Ward, Sr., 2663 W. Lone Cactus Dr. Suite D, Phoenix, Ariz. 85027-2414
Filed May 8, 2000, Appl. No. 567,310
Int. Cl. A01K *85/00*
U.S. Cl. 43—42.31 **19 Claims**



1. A floating fishing lure comprising in combination:
a body having a density less than that of water and having a longitudinal axis and a front portion for receiving a fish hook and a rear portion; and
protrusion means coaxial with the front portion and the rear portion extending outwardly from the body between the front portion and the rear portion for contacting the water in a slapping manner as the lure is moved on water, including
a concave portion and a rearwardly directed generally convex portion.
a front face on the concave portion, and
a plurality of ribs disposed in the concave portion and extending from said front face to the body for providing stability to maintain the front face generally perpendicular to the longitudinal axis.

US 6,408,567 B1
FISHING LURES AND METHODS AND MOLDS FOR MAKING SAME
Michael R. Clark, Pineville, La., assignor to Knight Manufacturing Co., Inc., Tyler, Tex.
Filed Mar. 12, 2001, Appl. No. 802,771
Int. Cl. A01K *85/00*
U.S. Cl. 43—42.53 **18 Claims**

1. A method of making a fishing lure having a predetermined shape from a predetermined material, comprising the steps of:
providing a porous air-containing body;
producing a cavity having said predetermined shape in said porous air-containing body;



covering said cavity with a non-porous coating;

producing a plurality holes in said non-porous coating in said cavity that vent said porous air-containing body through said holes at a plurality of spaced locations;

melting said material;

covering said holes in said cavity with melted material;

forming air bubbles inside of said melted material in said cavity by allowing air in said porous air-containing body to pass through said holes in said non-porous coating and into said melted material;

maintaining said melted material in said cavity for sufficient time to harden said melted material and trap said air bubbles inside said fishing lure, and

removing from said cavity said fishing lure with air bubbles trapped inside.

US 6,408,568 B1

COMPRESSED BLENDS OF COCONUT COIR PITH AND A NON-COIR/NON-PEAT MATERIALS, AND PROCESSES FOR THE PRODUCTION THEREOF

William E. Kusey, Richwood, and Mark Yelanich, Columbus, both of Ohio, assignors to OMS Investments, Inc., Wilmington, Del.

Filed Jan. 23, 2001, Appl. No. 768,169
Int. Cl. C09K *17/52;* **A01G** *1/00*
U.S. Cl. 47—9 **37 Claims**

22. A composition comprising a compressed blend of an initial volume of coconut coir pith and an initial volume of a horticulturally acceptable non-coir/non-peat material; the compressed blend being formed in a manner such that when the compressed blend is fluffed or outturned, a fluff yield of decompressed coconut coir pith and non-coir/non-peat material is produced which exceeds the sum of the initial volumes of the coconut coir pith and non-coir/non-peat material in the blend.

US 6,408,569 B1

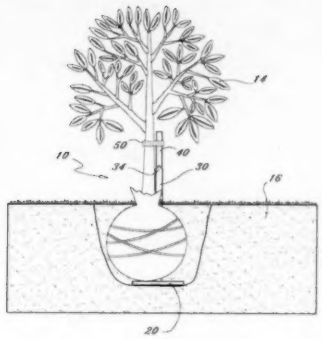
PLANT SUPPORT ASSEMBLY

Raymond P. Obregon, 1800 N. 14th St., Bismarck, N. Dak. 58501

Filed Sep. 22, 1999, Appl. No. 401,559
Int. Cl. A01G *17/14;17/06*
U.S. Cl. 47—47 **3 Claims**

1. A plant support assembly, comprising:

a base having a flat circular structure, wherein said base is positionable within a pot;



a tubular member having a lower end and an upper end, wherein said lower end of said tubular member is concentrically attached to said base orthogonally;

said upper end of said tubular member is a spiked end for inserting through the roots of a plant;

a shaft member slidably positionable within said tubular member, wherein said shaft is constructed of a material that can be easily severed;

wherein said tubular member and said shaft have a circular cross sectional area;

wherein said base, said tubular member and said shaft are constructed of a biodegradable material; and

a locking strap for securing said plant to said shaft.

US 6,408,570 B1

PLANT CULTIVATION DEVICE

Chao-Chang Shih, and Shu-Yen Peng Shih, both of No. 77, Yung-Dung St., South Dist., Taichung, Taiwan

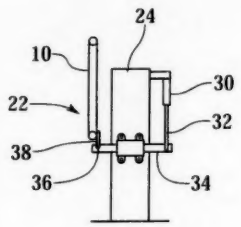
Filed Aug. 4, 2000, Appl. No. 632,917
Int. Cl. A01G *25/00*
U.S. Cl. 47—79 **17 Claims**

1. A plant cultivation device comprising:

a plate having a top edge, a lower edge and two ends, a plurality of holes defined therethrough and said two ends of said plate being engaged with each other, and

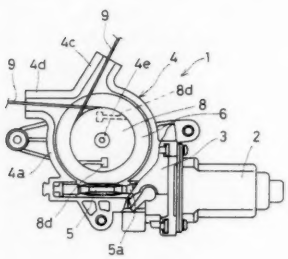
said plate having two slots defined therethrough and two boards extending through said slots and located close to said lower edge of said plate, a netted member supported on said two boards and located transversely relative to a longitudinal axis of the plate.

US 6,408,571 B1
AUTOMATIC CLOSING GATE
Donald E. Trott, 1801 Archer Dr., Sherman, Tex. 75092
Filed Nov. 2, 2000, Appl. No. 704,853
Int. Cl. E05F *13/00*
U.S. Cl. 49—263 **9 Claims**



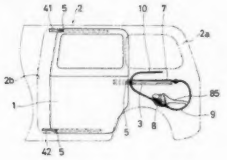
1. An automatic closing gate comprising:
a gate post;
a latch post for holding said gate in a closed position;
at least one self-closing hinge attaching the gate to the gate post; and
a catch post having a means for holding the gate in an open position for a selectable period of time.

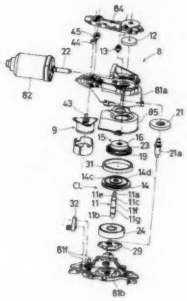
US 6,408,572 B1
DRIVING GEAR
Hiroyuki Uchimura; Masayuki Tamura, and Nobuo Kobayashi, all of Kiryu, Japan, assignors to Mitsuba Corporation, Kiryu, Japan
Filed Jun. 2, 2000, Appl. No. 585,413
Claims priority, application Japan, Jun. 3, 1998, 11-157135; Dec. 28, 1999, 11-374657; Apr. 24, 2000, 2000-122556
Int. Cl. E05F *11/48*
U.S. Cl. 49—352 **16 Claims**



1. A cable driving device, comprising:
a motor that provides a drive force;
a worm gear rotatable in association with the drive force of the motor;
a bottom cylindrically shaped casing that defines a side opening that faces the worm gear and an upper opening;
a cover that closes the upper opening of the casing;
a worm wheel disposed in the casing that meshes with the worm gear;
a drum;
cables wound around the drum; and
a damper that transmits the driving force of the motor from the worm wheel to the drum in a shock-absorbing state;
wherein the casing defines drawn-out guides that each form a groove and cooperate with the upper opening to enable the cables to be drawn outwardly from the drum; and
wherein the cover defines guide closures that cover the drawn-out guides.

US 6,408,573 B1
DRIVE DEVICE FOR VEHICULAR SLIDE DOORS
Ryoichi Fukumoto, Nagoya; Katsuhisa Yamada, Toyota; Masao Ohhashi, Kariya, and Shintaro Suzuki, Kasugai, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Dec. 14, 1999, Appl. No. 461,115
Claims priority, application Japan, Dec. 14, 1998, 10-355198
Int. Cl. E05F *11/00*
U.S. Cl. 49—360 **14 Claims**

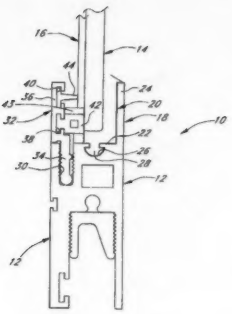




1. A drive device for a vehicular slide door comprising:
a shaft journaled in a casing and coupled to an electric driving source by way of a clutch mechanism for receiving a force to move the slide door;
an output gear mounted on the shaft for rotation together with the shaft;
a rotor accommodated in the casing and rotated together with the shaft;
a movable plate accommodated in the casing, rotatable relative to the shaft and adapted to be coupled to the rotor in a detachable manner;
an armature secured to the movable plate;
an electric coil winding device secured to the casing in opposition to the armature via the rotor and cooperating with the armature and the rotor to constitute a magnetic closed loop which attracts the armature toward the rotor to thereby couple the movable plate and the rotor;
a magnetic member secured to the rotor at a position outside the magnetic closed loop; and
a sensor secured to the casing and provided with a Hall element for detecting rotation of the rotor.

US 6,408,574 B1
QUICK RELEASE SACRIFICIAL SHIELD AND WINDOW ASSEMBLY
Jerry L. Farrar, Banning, and Jesse E. Shepard, Corona, both of Calif., assignors to Transit Care, Inc., Murrieta, Calif.
Continuation-in-part of application No. 09/186,513, filed on Nov. 4, 1998, now Pat. No. 6,205,723. This application Sep. 13, 1999, Appl. No. 395,692.
Int. Cl. E05F *11/38*
U.S. Cl. 49—375 **15 Claims**

1. A window assembly for a mass transportation vehicle, the assembly comprising:
a piece of glazing having a first and a second side;
a first protective panel extending over and protecting the first side of the piece of glazing;
a frame defining a frame opening wherein the frame is adapted to receive the piece of glazing so that the piece of glazing can be retained in the frame opening with the first protective panel positioned adjacent the first side of the piece of glazing wherein the frame further defines a retaining opening that is formed in the frame opening and is located adjacent the first protective panel when the piece of glazing and the first protective panel are positioned within the opening; and



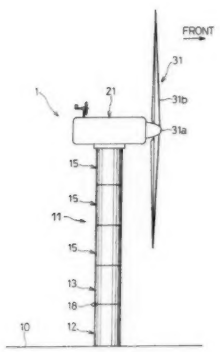
a retainer having a leg that is positioned in the retaining opening such that the retainer retains the piece of glazing within the frame opening and wherein the retainer is adapted so that when the retainer is positioned in the retaining opening and the first protective panel and the piece of glazing are positioned within the frame opening, the first protective panel inhibits removal of the retainer from the retaining surface.

US 6,408,575 B1

HORIZONTAL AXIS TYPE WIND TURBINE AND METHOD OF CONSTRUCTION THEREOF

Shigeo Yoshida; Yuji Kawakita; Yasuhiro Koshioka; Toru Nagao, and Noriyuki Takahashi, all of Tokyo-To, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo-To, Japan

Filed Mar. 29, 2000, Appl. No. 537,512
Claims priority, application Japan, Mar. 30, 1999, 11-087705
Int. Cl. E04H *12/34*
U.S. Cl. 52—40 **9 Claims**



1. A horizontal axis type wind turbine having a tower mounted on a base, a nacelle mounted on said tower and a rotor supported by said nacelle, said tower comprising:

a base tower member mounted on said base;

a lower tower member hingedly connected at a lower end thereof with an upper end of said base tower member through a hinge so as to swing from a lying position to a standing position;

a first stage connecting tower member connected at a lower end thereof with an upper end of said lower tower member; and

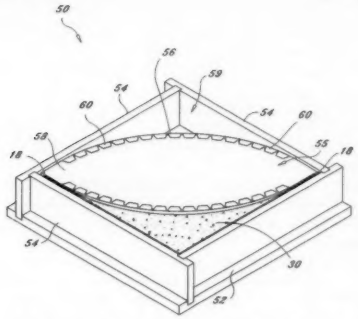
a highest stage connecting tower member connected at a lower end thereof with an upper end of a second highest stage connecting member.

US 6,408,576 B1

ARCH MOLD APPARATUS AND METHOD FOR MAKING ARCHES

Douglas Roth, 4829 Badger Rd., West Palm Beach, Fla. 33417

Filed Oct. 20, 2000, Appl. No. 693,212
Int. Cl. E04G *15/02;* **E06B** *1/24*
U.S. Cl. 52—85 **13 Claims**



1. An arch segment molding kit for making quarter arch segments that are mountable in the upper corners of passageways, which have predetermined wall widths, to facilitate the formation of archways, said arch segment molding kit comprising:

a substantially rectangular base;

at least two side boards being removably mountable to said base along adjacent edges;

an arcuate wall projecting upward from said base and extending substantially between said adjacent walls, said arcuate wall and said side boards defining a plaster receiving chamber;

at least one securing flange being at least partially disposable inside said chamber along each of said boards; and

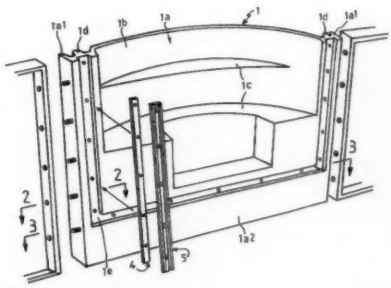
means for receiving a fill that hardens over time inside said chamber.

US 6,408,577 B1

STEPS FOR SWIMMING POOL

Jean Louis Desjoyaux, L'Etrat; Pierre Louis Desjoyaux, La Fouillouse, and Catherine Jandros, Orangerie, all of France, assignors to Piscines Desjoyaux, S.A., France

Continuation of application No. PCT/FR98/02587, filed on Dec. 2, 1998. This application Jun. 15, 2000, Appl. No. 594,923.
Claims priority, application France, Dec. 17, 1997, 9716289
Int. Cl. E04F *11/00*
U.S. Cl. 52—182 **4 Claims**



1. Steps for a swimming pool that define a recessed front face shaped to form treads, said steps further arranged for connection without discontinuity to other adjacent panels or other elements of a basin of said swimming pool, said steps further having a plurality of ribs on each front end of said recessed front face, said ribs

providing additional thickness on the inside of said recessed front face with spacings between adjacent said ribs designed to act as grooves for supporting an internal plasticized fabric or liner, said grooves being capable of accepting a clamping strip for engaging said internal plasticized fabric or liner to said grooves for a seal for watertight fixing of said internal plasticized fabric or liner to said grooves using fixing means in said extra thickness of said ribs, said steps with the ribs being made by a process of injection molding a plastic material.

US 6,408,578 B1

METHOD OF FINISHING EDGE OF SHEET GLASS, HEAT-TEMPERED SHEET GLASS USING THE METHOD, AND FIRE-RESISTANT CONSTRUCTION MATERIAL USING THE HEAT-TEMPERED SHEET GLASS

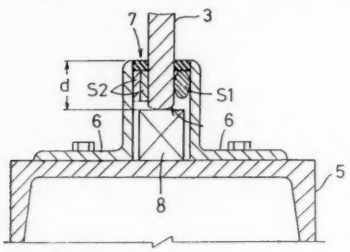
Keisuke Tanaka; Kiminari Sugiura, and Shigeki Obana, all of Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Division of application No. 09/067,726, filed on Apr. 28, 1998, now Pat. No. 6,004,655, which is a continuation of application No. 08/547,813, filed on Oct. 25, 1995, now abandoned. This application Nov. 23, 1999, Appl. No. 447,486.

Claims priority, application Japan, Oct. 26, 1994, 6-260859; Sep. 8, 1995, 7-231055

Int. Cl. E06B *3/66*

U.S. Cl. 52—204.62 **3 Claims**



1. A fire-resistant construction material comprising:

a said for holding a heat-tempered sheet glass, the sash including an annular metal sash body forming a door portion and a metal holding portion for holding the sheet glass;

wherein said metal holding portion includes a metal holder member and in incombustible place, said heat-tempered sheet glass being fixedly retained at an edge thereof within a gap formed between said metal holder member and said incombustible plate.

US 6,408,579 B1

THIN PANEL BEAM

Craig M. Anderson, Kentwood, and Douglas B. MacDonald, Caledonia, both of Mich., assignors to Steelcase Development Corporation, Caledonia, Mich.

Filed Apr. 25, 2000, Appl. No. 558,552

Int. Cl. E04B *2/76;* **E04C** *2/52*

U.S. Cl. 52—220.7 **18 Claims**

1. A partition panel for offices, comprising:

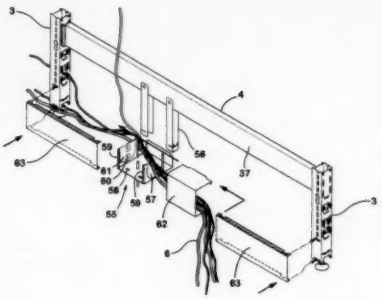
a panel frame having a generally rectangular perimeter and parallel, horizontally spaced-apart vertical side faces and an open interior space that permits internal routing of utility lines;

at least one cover panel secured to said panel frame and closing off said open interior space;

said panel frame having a horizontal member disposed between said vertical side faces, said horizontal member having a first side face spaced inwardly from said first cover panel to form a gap therebetween to permit vertical routing of utility lines through said gap, said panel frame having a lower portion configured to support said frame on a floor surface, said horizontal member positioned adjacent said lower portion;

a utilities infeed module connected to said horizontal member and having an opening to permit routing of utility lines from said open interior space to an office space exterior of said partition panel; and including:

a bracket rigidly interconnecting said utilities infeed module to said horizontal member and positioning said utilities infeed module below said horizontal member.



US 6,408,580 B1

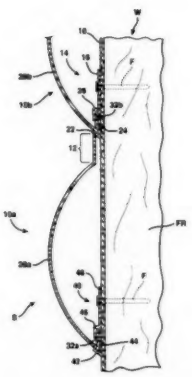
SIDING SYSTEM

Erik K. Jurvis, and Rochelle Gail Jurvis, both of Houghton Lake, Mich., assignors to Owens Corning Fiberglas Technology, Inc., Summit, Ill.

Filed Jul. 24, 2000, Appl. No. 624,672

Int. Cl. E04D *1/00*

U.S. Cl. 52—233 **20 Claims**



1. A siding strip capable of engaging an adjacent siding strip to cover a portion of a stable mounting structure, comprising:

an elongated body including a main portion, a fastener portion, a fastener receiving section having a channel for receiving and capturing a fastener portion of the adjacent siding strip, and at least one first integral portion between said fastener receiving section and said main portion having an outer surface simulating the appearance of grout or chinking,

whereby said first integral portion on said siding strip is exposed when the adjacent siding strip is engaged to simulate the appearance of grout or chinking between the strips.

US 6,408,581 B2

FOUNDATION ELEMENT, METHODS FOR THE CONSTRUCTION OF PREFABRICATED STRUCTURES INCLUDING THESE ELEMENTS, PARTICULARLY PREFABRICATED TUNNELS, AND PREFABRICATED STRUCTURES MADE BY THESE METHODS

Mosé Monachino, Via A. Doria 5, I-92014, Porto Empedocle (Agrigento), Italy

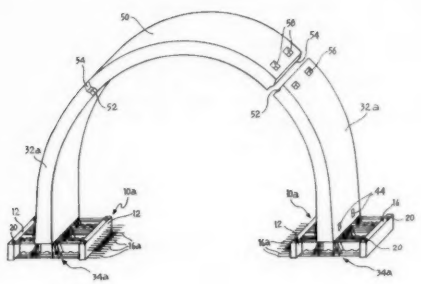
Division of application No. 09/230,147, filed on Jan. 19, 1999. This application Jul. 18, 2001, Appl. No. 908,368.

Claims priority, application Italy, Jul. 17, 1996, AG96A0002; Sep. 30, 1996, AG96A0003

This patent is subject to a terminal disclaimer.

Int. Cl. E04B *6/16;1/32*

U.S. Cl. 52—247 **14 Claims**



1. A foundation element for supporting a superstructure element on substantially flat ground, said foundation element comprising a rigid, prefabricated, monolithic frame, including at least two opposite, containing side walls and cross-members interconnecting the two side walls to form a casting through-cavity between the two side walls, wherein said frame comprises a prefabricated element of reinforced conglomerate, and wherein the side walls and the cross-members are formed integrally with the side walls, said frame further comprising at least two transverse iron bars spaced from and parallel to each other and the cross-members, the ends of which bars are anchored in the side walls, said frame having adjustable support devices associated with each of the side walls for adjusting the walls at a height above the ground, whereby said monolithic frame may be placed on the ground supported on the adjustable support devices for receiving a hardenable fluid binder material in its through-cavity, whereupon binder material is able to spill out onto the ground between the ground and the side walls and to fill the cavity so as to encapsulate the cross-members and any connector members supported on and projecting from said cross-members for connection to the superstructure element, which, after hardening forms, with said monolithic frame, a monolithic mass which connects the foundation element and the superstructure element permanently to the ground.

US 6,408,582 B1

INSULATION SYSTEM OF A BUILDING WHEREIN VERTICAL AIR-FLOW ZONES DIVIDED BY ORIENTATION OR EACH FACADE OF THE BUILDING IS CONTROLLED BY OPEN-CLOSE METHOD

Shang Kooun Shim, Seoul, Rep. of Korea, assignor to Himmsen Esco Co., Ltd., Seoul, Rep. of Korea

Filed Apr. 28, 2000, Appl. No. 559,576

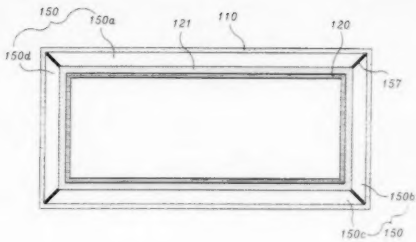
Claims priority, application Rep. of Korea, Apr. 30, 1999, 99-15742

Int. Cl. E04F *17/04*

U.S. Cl. 52—302.1 **7 Claims**

1. A heat insulation system of a building, comprising:

a plurality of interior walls surrounding an inner space of the building;



a plurality of exterior walls constructed outside of the plurality of interior walls with a certain distance therebetween;

an air-flow zone defined by a space formed between the plurality of interior walls and the plurality of exterior walls; and

a plurality of air-flow zone dividers dividing the air-flow zone into a plurality of independently controllable air-flow blocks, the plurality of air-flow zone dividers being arranged so that each air-flow block of the plurality of independently controllable air-flow blocks corresponds with a respective facade of the building.

US 6,408,583 B1

SECTION FIXABLE TO AN ANCHORING BASE

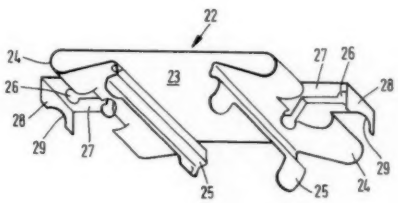
Theo Hertweck, Baden-Baden, Germany, assignor to Profil-Vertrieb GmbH, Gaggenau, Germany

Filed Jan. 18, 2000, Appl. No. 484,769

Claims priority, application Germany, Feb. 27, 1999, 199 08 585

Int. Cl. E04F *13/08*

U.S. Cl. 52—334 **5 Claims**



1. A section fixable in a mounted position to an anchoring base by means of fastening screws having a screw head with a surface for engaging a screwdriver comprising

at least one fastening segment adapted to extend substantially parallel to the anchoring base in the mounted position,

at least one screw hole disposed in said fastening segment for receiving a fastening screw drivable into an installed position in the anchoring base in which the screw head grips over an edge of the screw hole,

a safety tab projecting from the fastening segment at least in an area of the screw hole, said safety tab with the fastening screw in the installed position being deformable into a safety position in which said safety tab grips over an edge of the screw and leaves free the surface engaged by the screwdriver.

US 6,408,584 B1
PRE-FABRICATED WOOD UNDERLAYMENT AND TILE SYSTEM
Rhonda Annette Rodriguez, 3 Austin Ave., C'ville, Ill. 60110
Filed Nov. 29, 1999, Appl. No. 451,218
Int. Cl. E04F *13/08*
U.S. Cl. 52—390 **8 Claims**

1. A pre-fabricated vinyl tile system for use as a floor comprising a plurality of vinyl tile boards connected in interlocking relationship, the vinyl tile boards consisting of:

(a) a wooden underlayment, the wooden underlayment having a top surface, a bottom surface, two opposed end edges, and two opposed side edges, the bottom surface of the wooden underlayment capable of being attached to floor and wall surfaces;

(b) interlocking means integrated into and extending along the width of the two opposed end edges of the wooden underlayment for interlocking tile boards longitudinally;

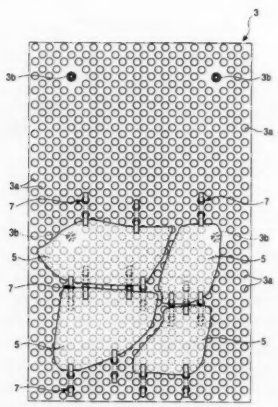
(c) interlocking means integrated into and extending along the length of the two opposed side edges of the wooden underlayment for interlocking tile boards laterally;

(d) an adhesive layer, the adhesive layer applied to the top surface of the wooden underlayment;

(e) a layer of vinyl tiles having a top surface and a bottom surface placed in a contiguous relationship over the top surface of the wooden underlayment so that the layer of vinyl tiles form a continuous tile floor when the vinyl tile boards are interlocked, the bottom surface of the layer of vinyl tiles adhered to the adhesive layer; and

(f) a protective release cover releasably adhered to the top surface of the layer of vinyl tiles, the protective release cover protecting the layer of vinyl tiles during installation of the vinyl tile board.

US 6,408,585 B1
ATTACHMENT STRUCTURE FOR UNDEFINED OR RANDOM-SHAPED WALL FACING MATERIAL
Hiroshi Tajima, 1-20-3, Minamikoyacho, Hitachi-Shi, Ibaraki, Japan, 319-1224
Filed Apr. 10, 2000, Appl. No. 546,230
Claims priority, application Japan, Apr. 19, 1999, 11-111435
Int. Cl. E04B *2/00;5/00;9/00*
U.S. Cl. 52—506.06 **17 Claims**



1. An attachment structure for random-shaped wall facing material, said attachment structure comprising:

a backing;

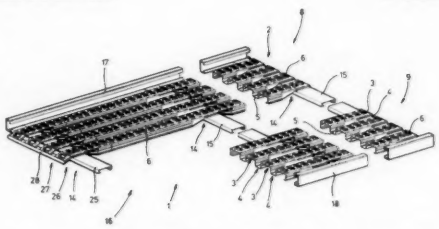
a retaining plate provided with a plurality of retaining portions over a surface of said retaining plate, said retaining plate being attached to a front plane of said backing;

a plurality of random-shaped wall facing material pieces arrayed on a front plane of said retaining plate in an arbitrary layout, said random-shaped wall facing material pieces being adhered to said retaining plate and said backing by an adhesive agent;

a plurality of attachment pieces being operable to support at least an upper edge portion and a lower edge portion of each of said random-shaped wall facing material pieces, said attachment pieces being retained by said retaining portions of said retaining plate; and

a jointing material filling space in between adjacent ones of said random-shaped wall facing material pieces.

US 6,408,586 B1
PERFORATED SHEET FLOORPLATE ELEMENT
Serge Deckert, Mundolsheim, France, assignor to Lohr Industrie, Hangenbieten, France
PCT No. PCT/FR93/00462, § 371 Date Aug. 30, 1999, § 102(e) Date Aug. 30, 1999, PCT Pub. No. WO93/23279, PCT Pub. Date Nov. 25, 1993
PCT Filed May 13, 1993, Appl. No. 335,692
Claims priority, application France, May 15, 1992, 92 06096
Int. Cl. E04C *2/38*
U.S. Cl. 52—630 **20 Claims**



1. A floorplate element for use as a load bearing surface for a vehicle, the floorplate element comprising a folded sheet which forms a corrugation (**2**) having a plurality of sequentially and longitudinally extending planar raised areas (**3**) and recessed grooves (**4**) spaced from one another by lateral walls (**22**, **23**), and the corrugation (**2**) having a plurality of bends (**10**, **11**, **12**, **13**);

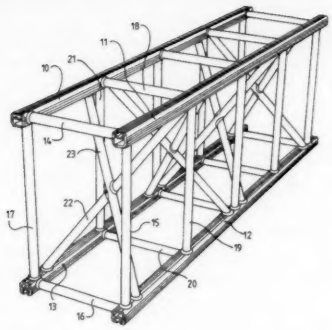
wherein the corrugation (**2**) has at least one transverse recessed area (**14**) formed by a controlled localized compression of a portion of the grooves (**4**) and the lateral walls (**22**, **23**) toward an upper surface of the raised areas (**3**), without deformation of the upper surface of the raised areas (**3**) in the at least one transverse recessed area (**14**), and the at least one transverse recessed area (**14**) extends transverse to a longitudinal direction of the floorplate element and forms a bearing surface for supporting the floorplate element by a crossbeam (**15**, **25**) of a supporting structure (**16**).

US 6,408,587 B2
STRUCTURAL MEMBERS AND ASSOCIATED PARTS
Christopher Patrick Noel Cronin, Severnstoke, and Neil Howard Darracott, Rugby, both of United Kingdom, assignors to Total Fabrications Limited, United Kingdom
Filed Dec. 21, 2000, Appl. No. 746,586
Claims priority, application United Kingdom, Dec. 24, 1999, 9930628; Sep. 9, 2000, 0022152; Sep. 9, 2000, 0022154
Int. Cl. E04B *1/00*
U.S. Cl. 52—637 **21 Claims**

1. A structural member having a first end and a second end and comprising:

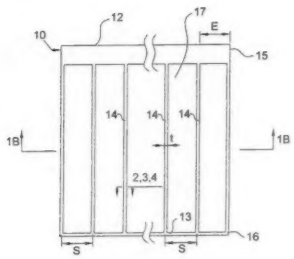
at least three spaced apart elongate elements extending between the first end and the second end, each of the elongate elements disposed generally parallel relationship to each other;

a plurality of interconnecting elements extending between the elongate elements, the interconnecting elements maintaining the elongate elements in the generally parallel relationship;



at least one of the elongate elements comprising a track formation extending between the first end and the second end, the track formation being unobstructed by any of the interconnecting elements, the track formation adapted to receive therein an attachment member such that the attachment member may engage the track formation at any position along the at least one elongate element between the first end and the second end.

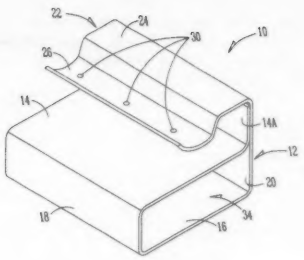
US 6,408,588 B1
PREFABRICATED WOODEN WALL FRAMEWORK
Francis Sean Kelly, 2170 Rankintown Rd., Finleyville, Pa. 15332
Filed Mar. 18, 1999, Appl. No. 272,725
Int. Cl. E04H *12/02*
U.S. Cl. 52—653.1 **19 Claims**



1. A prefabricated wall framework comprising a unitary molded wood composite defining elongated molded headers spaced apart by each of a plurality studs integrally molded with the headers at spaced apart regular intervals to extend perpendicular between the elongated lengths of the headers, said headers being suitable for fastening to floor and ceiling joints and with said studs occurring at regular intervals suitable to support a wall board to form a wall.

US 6,408,589 B1
CLIP FOR ATTACHMENT TO FLANGES OF STRUCTURAL STEEL
Donavon G. Bousquet, 3300 A St., South Sioux City, Nebr. 68776
Provisional application No. 60/149,139, filed on Aug. 16, 1999. This application Aug. 10, 2000, Appl. No. 635,612.
Int. Cl. E04C *3/30*
U.S. Cl. 52—714 **4 Claims**

4. A clip for attachment to the flange of a structural member, comprising,



a single sheet of lightweight metal bent into a configuration having a horizontal top surface spaced from and parallel to a bottom surface,

and side members connecting the top and bottom surfaces,

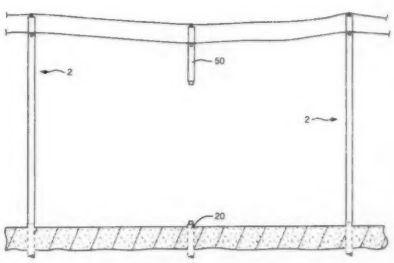
a first opening enclosed by the top and bottom surfaces and the sides,

one of the sides extending above the top surface to form a side extension,

a flange extending upwardly from an edge of the top surface and dwelling against the side extension and being spot welded thereto,

and a clip element formed on a top edge of the side extension and extending over in spaced relation to the upper surface to frictionally receive the flange of a structural member.

US 6,408,590 B1
BREAKAWAY UTILITY POLE
Armand Cote, Leicester, Mass., assignor to Armand G. Cote, Jr., Leicester, and Armand G. Cote, III, Whitinsville, both of Mass.
Provisional application No. 60/056,431, filed on Aug. 25, 1997. This application Aug. 26, 1998, Appl. No. 140,049.
Int. Cl. E04C *3/30*
U.S. Cl. 52—726.4 **9 Claims**



1. A plastic breakaway utility pole, comprising:

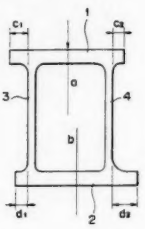
a solid, plastic lower member for embedding in the group and having a connector at its top, protruding from the ground;

an intermediate hollow, plastic generally cylindrical member interfitted into said lower member connector and protruding up, and having a connector at its top; and

a solid plastic top member interfitted into said intermediate member connector, and having means for carrying utility wires;

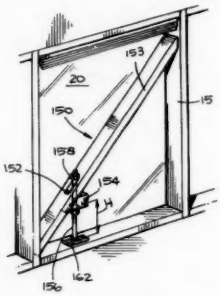
wherein said intermediate member is a hollow plastic tube which is adapted to fracture upon a relatively low impact from an automobile.

US 6,408,591 B1
DOOR BEAM OF ALUMINUM ALLOY
Hiroyuki Yamashita; Hisashi Takeuchi, and Masakazu Hirano, all of Shimonoseki, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
Filed Mar. 26, 1999, Appl. No. 277,224
Claims priority, application Japan, Mar. 27, 1998, 10-100080
Int. Cl. E04C *3/30*
U.S. Cl. 52—731.6 **21 Claims**



1. A door beam of an aluminum alloy having a cross-section that a compression-side flange and a tension-side flange are connected parallel to each other, by at least two webs in a section perpendicular to a length direction and central lines of the compression-side flange and a tension-side flange are shifted from each other.

US 6,408,592 B1
METHODS AND APPARATUSES FOR PROTECTING WINDOWS AND BUILDINGS DURING A WIND STORM
Monzer A. Hourani, #3 Carlton Park, Houston, Tex. 77024
Filed Sep. 18, 2000, Appl. No. 665,155
Int. Cl. E04B *1/00*
U.S. Cl. 52—741.3 **62 Claims**

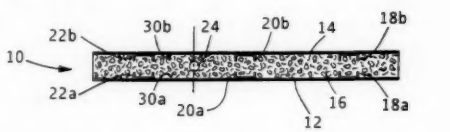


1. A brace for protecting a window during a high wind storm, comprising:
a rigid member sized so as to fit within a window frame containing the window to be protected;
an adhesive layer affixed to one side of the rigid member for affixing the rigid member to the window to be protected; and
a means for imparting a force between the rigid member and the window frame.

US 6,408,593 B1
SHINGLE COMPOSITION
Pete Foster, and Donald E. Dilks, both of 7017 Manor, Ft. Worth, Tex. 76180
Filed Sep. 1, 1999, Appl. No. 387,484
Int. Cl. E04D *1/20;* **C08L** *9/06*
U.S. Cl. 52—748.1 **4 Claims**

1. A method of roofing a structure, the method comprising the steps of:
providing a shingle for the roof of the structure, the shingle composition comprising:
(a) a styrene-butadiene copolymer rubber component present in the range from about 5–95% by weight, based on the total weight of the composition;
(b) an ethylenic polyolefin component selected from the group consisting of polyethylene, ethylene acrylic acid copolymers, ethylene acrylate copolymers and ethylene vinyl acetate copolymers, the ethylenic polyolefin component being present in the range from about 5–50% by weight, based on the total weight of the composition;
wherein the shingle composition is further characterized as having a weight of less than 150 pounds per roofing square for ⅛ inch thickness, which meets the flame retardancy requirements of FMVSS-302 at thicknesses of ⅛ inch thickness and higher without the addition of separate flame retardant components ,and wherein the shingle composition is further characterized by the absence of an asphaltine constituent ;and
installing the shingle on the roof of the structure.

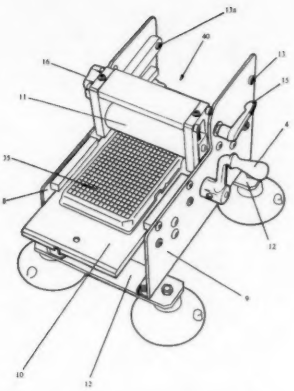
US 6,408,594 B1
REINFORCED STRUCTURAL INSULATED PANELS WITH PLASTIC IMPREGNATED PAPER FACINGS
William H. Porter, P.O. Box 249, Saugatuck, Mich. 49453
Filed Jun. 16, 1999, Appl. No. 334,233
Int. Cl. E04C *2/34*
U.S. Cl. 52—794.1 **39 Claims**



1. A reinforced, insulated flat structural panel comprising:
a generally flat insulating core having first and second opposed sides;
first and second planar sheets of plastic impregnated paper respectively disposed on the first and second sides of said insulating core for providing the panel with high tensile strength;
first and second elongated, linear structural members respectively disposed in contact with said first and second sheets of plastic impregnated paper and extending substantially the entire length of the panel for increasing the bending strength of the panel and for attaching the panel to a support structure; and
an adhesive disposed on said first and second structural members for respectively bonding said first and second structural members to said first and second sheets of plastic impregnated paper, wherein said first and second structural members are respectively in contact with an inner surface of said first and second sheets of plastic impregnated paper and are disposed entirely within and displaced inwardly from an edge of the panel, and wherein said adhesive further bonds said first and second structural members to said insulating core.

US 6,408,595 B1
MICROPLATE COVER SEAL APPLICATOR
Mitchell A. Friedman, Randallstown, Md., assignor to Union Scientific Corporation, Randallstown, Md.
Provisional application No. 60/163,035, filed on Nov. 2, 1999. This application Nov. 1, 2000, Appl. No. 703,462.
Int. Cl. B65B *7/28*
U.S. Cl. 53—329 **15 Claims**

1. A microplate cover seal applicator comprising:
a base;



a microplate support tray slidably mounted in said base for repetitive, bidirectional movement of said microplate support tray and of a microplate mounted on said support tray;

a roller mount attached to said base above said microplate support tray and fixedly positionable in a variety of vertical positions with respect to said support tray; and

a roller freely rotatably mounted within said roller mounts, means for driving said support in either of the two directions while said roller presses on said tray.

US 6,408,596 B1

DEVICE FOR PACKAGING

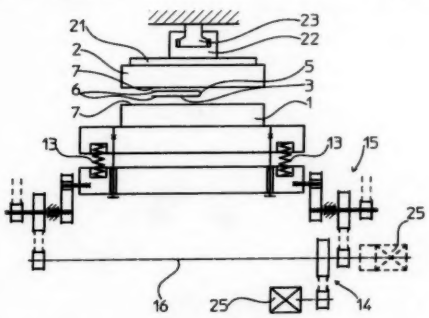
Roman Kammler, Worms, Germany, assignor to Rovema Verpackungsmaschinen GmbH, Fernwald, Germany

Filed Apr. 7, 2000, Appl. No. 545,256

Claims priority, application Germany, Apr. 9, 1999, 199 16 003

Int. Cl. B65B *51/10*

U.S. Cl. 53—373.7 **13 Claims**



13. A device for packaging comprising first and second spaced apart sealing jaws configured to weld a foil web extending therebetween and moving in a transport direction in a horizontal plane of movement, the foil web being folded along its centerline such that edges of the foil web abut one another, the first and second sealing jaws being aligned vertically, the first sealing jaw being carried by a support that is coupled to a drive mechanism, the drive mechanism being configured to rotate the first sealing jaw about an axis such that the first sealing jaw moves toward the foil web and contacting the foil web at a first position, with the foil web in a first path of movement from the first position to a second position, away from the foil web beginning at the second position, and back to the first position along a second path of movement that is different than the first path of movement, a rail extending along the plane of movement of the foil web and being parallel to the first path of movement of the first sealing jaw, the second sealing jaw being carried by a carriage configured to be moved along the rail, the carriage being coupled to the support by at least one carrier, the at least one carrier extending through the plane of movement of the foil web, so that movement of the first sealing jaw along the first and second paths of movement will cause the second sealing jaw to reciprocate along the rail in a third path of movement between third and fourth positions, wherein the third oath of movement is parallel to the first path of movement of the first sealing jaw.

US 6,408,597 B1

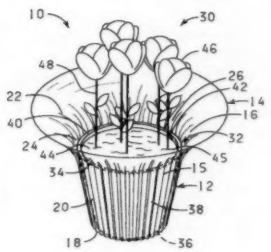
ACCORDION-TYPE PLANT COVER WITH ATTACHED SKIRT AND METHODS

Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc., Highland, Ill.

Continuation of application No. 09/031,129, filed on Feb. 26, 1998, now Pat. No. 6,173,552, which is a division of application No. 08/242,477, filed on May 13, 1994, now Pat. No. 5,974,376. This application Mar. 28, 2000, Appl. No. 536,787.

Int. Cl. B65B *25/02;* **A01G** *9/02*

U.S. Cl. 53—397 **10 Claims**



1. A method for providing a decorative cover for a flower pot having an upper end, a lower end and an outer peripheral surface, comprising:

providing a flower pot cover comprising:

a base having an upper end a lower end, an outer peripheral surface an inner peripheral surface defining a pot retaining space, and a plurality of pleats, at least a portion of the plurality of pleats disposed near the upper end of the base and at least another portion of the plurality of pleats disposed near the lower end of the base to permit the base to be selectively expanded from a contracted condition; and

a skirt extending from the upper end of the base, the skirt configured so as to be substantially non-pleated;

expanding the pleats of the base such that the inner peripheral surface of the base has a diameter greater than a diameter of the flower pot;

inserting the flower pot into the pot retaining space of the base; and

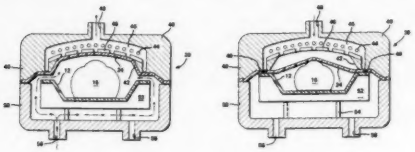
releasing the base such that the pleats of the base contract causing the base to contactingly engage the outer peripheral surface of the flower pot while the skirt extends from the upper end of the flower pot and remains substantially non-pleated.

US 6,408,598 B1

MODIFIED ATMOSPHERE PACKAGE FOR HIGH PROFILE PRODUCTS FROM UPWARDLY FORMED HEAT SHRINKABLE FILM

H. Walker Stockley, III, Spartanburg, S.C., assignor to Cryovac, Inc., Duncan, S.C.

Filed Dec. 23, 1998, Appl. No. 220,270
Int. Cl. B65B *31/00*
U.S. Cl. 53—433 **8 Claims**



1. A packaging process, comprising:

a) providing a support member comprising a product support surface and a periphery;

b) providing a film comprising a sealant layer, the sealant layer being sealable to the support member;

c) orienting the film to an-orientation ratio of from about 6.0:1 to about 16.0:1;

d) positioning a product on the product support surface of the support member such that at least a portion of the product extends upwardly above the level of the periphery;

e) extending the film above the support member and product, the sealant layer being immediately above and adjacent to the support member and the product;

f) drawing the film into a concavity by differential pressure;

g) maintaining the concave shape of the film while heating the film;

h) removing gases from the space between the film and the support member and product;

i) introducing a desirable gas into said space;

j) releasing the film such that it moves toward the product and the support member, the desirable gas being retained within the space precluding close contact of the film with the lowermost portions of the product; and

k) sealing the film to the periphery of the support member, wherein at least the steps of heating the film shrinks the film, thereby tensioning it onto and across the underlying product.

US 6,408,599 B1

METHOD OF AND DEVICE FOR ADJUSTING POSITION FOR CUTTING BAGS AND PACKAGING MACHINE INCORPORATING SAME

Yukio Nakagawa, and Masashi Kondo, both of Shiga, Japan, assignors to Ishida Co., Ltd., Shiga-ken, Japan

Division of application No. 09/306,481, filed on May 6, 1999, now Pat. No. 6,088,994, and a continuation-in-part of application No. 09/233,768, filed on Jan. 20, 1999, now abandoned. This application Feb. 16, 2000, Appl. No. 505,020.
Claims priority, application Japan, Jan. 20, 1998, 10-022750; May 13, 1998, 10-129925; Jan. 5, 1999, 11-000730
Int. Cl. B65B *9/20;57/04*
U.S. Cl. 53—451 **3 Claims**

1. A method of controlling a packaging machine, said packaging machine comprising means for causing an elongated film having detectable eye marks and defined cut-positions thereon to travel on a path, a pair of seal jaws for moving cyclically in part along said path to clamp and cut the film transversely to form separated bags and a detector for detecting the eye marks, said method comprising the steps of:

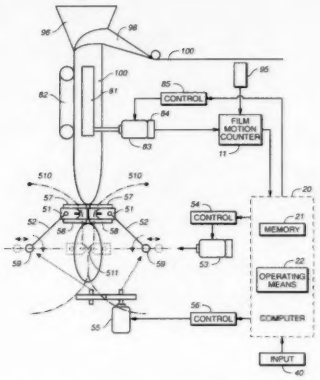
moving the film on the path;

starting to move said seal jaws when a specified travel condition becomes satisfied after one of the eye marks is detected by the detector;

thereafter advancing the film to a clamping position and causing said film to be clamped at said clamping position between the seal jaws and cut along a cut-line on said film to thereby produce a dummy bag; and

adjusting said specified travel condition according to the position of said cut-line to produce said dummy bag;

wherein said adjusting step comprises the steps of measuring a distance of travel by the film from when one of the eye marks is detected by the detector until one of the cut-positions passes said clamping position; and calculating a timing for starting said seal jaws to move from initial positions therefor according to the measured distance of travel and setting said calculated timing for said seal jaws.

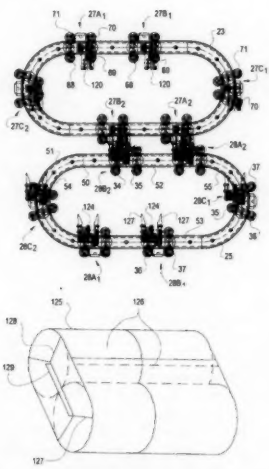


US 6,408,600 B1

WRAPPING APPARATUS AND PROCESS

Wayne T. Nankervis, Hortonville; Neal R. Monigal, Menasha; Alan R. Wanek, Green Bay; Richard D. Sorenson, Sheboygan; Jeffrey A. Ginzl, Green Bay; Matt L. Brugman, Green Bay, and Brian L. Hopkinson, Green Bay, all of Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.

Filed May 25, 2000, Appl. No. 579,104
Int. Cl. B65B *51/10;51/18*
U.S. Cl. 53—477 **16 Claims**



1. A sealing apparatus for sealing a film to form a package which moves along a path having right and left sides, the sealing apparatus comprising:

right and left upper tracks which are spaced apart transversely with respect to said path,

right and left lower tracks which are spaced apart transversely with respect to said path,

each of said tracks having upper and lower portions which are generally parallel to said path and a pair of curved end portions which connect the upper and lower portions, the lower portions of the upper tracks being adjacent to the upper portions of the lower tracks,

a plurality of upper die assemblies mounted for movement on the upper tracks, each of the upper die assemblies including a right carriage and a left carriage which are supported by the right and left upper tracks, respectively, and an upper die which extends between the carriages,

a plurality of lower die assemblies mounted for movement on the lower tracks, each of lower die assemblies including a right carriage and a left carriage which are supported by the right and left lower tracks, respectively, and a lower die which extends between the carriages,

each of the upper die assemblies being associated with one of the lower die assemblies to form a pair of upper and lower die assemblies,

means for moving each pair of die assemblies around the upper and lower tracks so that the die assemblies of each pair meet and travel together along said adjacent portions of the tracks, each of the upper and lower die assemblies includes a right carriage and a left carriage, each of the upper and lower dies being pivotally connected to a right carriage at a right pivot point and being pivotally connected to a left carriage at a left pivot point, the right and left pivot points of each die being offset both in the direction of said path and in a direction which is transverse to said path whereby each die is maintained in a substantially constant orientation as the die moves around the tracks.

US 6,408,601 B1

APPARATUS FOR FILLING PACKAGING CONTAINERS

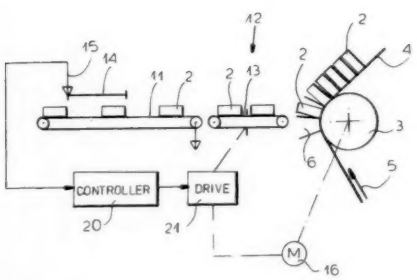
Heinz F. Odenthal, Zülpich, and Marian Cioc, Euskirchen, both of Germany, assignors to Nor-Reg AS, Honefoss, Norway

Filed Nov. 10, 1999, Appl. No. 437,460

Claims priority, application Germany, Nov. 11, 1998, 198 51 801

Int. Cl. B65B *57/14*

U.S. Cl. 53—493 **4 Claims**



1. In combination:

means including a package supply for feeding packages at a variable spacing one after another to a transfer station;

a pocket belt offset from the transfer station;

an intermediate belt extending through the transfer station from the supply to the pocket belt;

drive means for continuously advancing the pocket belt at a variable pocket-belt speed;

drive means for advancing the intermediate belt at a variable intermediate-belt speed forming a predetermined ratio with the pocket-belt speed and thereby moving the packages on the intermediate belt from the supply to the pocket belt;

a single sensor for determining the spacing between succeeding packages only at the supply; and

control means connected to the pocket-belt drive means, to the intermediate-belt drive means, and to the sensor means for changing the predetermined ratio in accordance with the sensed spacing between succeeding packages as they arrive at the transfer station from the supply, whereby the speeds are varied so the intermediate-belt speed forms a greater proportion of the pocket-belt speed when the sensed spacing increases and the speeds are varied so the intermediate-belt speed forms a smaller proportion of the pocket-belt speed when the sensed spacing decreases.

US 6,408,602 B1

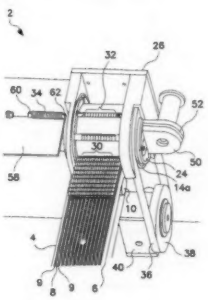
APPARATUSES FOR FORMING A COMPRESSED GROUPING OF OBJECTS

Dennis Rejcek; Terry Brinkerhuff; Ron Rieger; Dennis Lenart; Mike McGee, and Johnny Black, all of Waco, Tex., assignors to Mars Incorporated, McLean, Va.

Filed Jul. 27, 1999, Appl. No. 361,415

Int. Cl. B65B *35/30*

U.S. Cl. 53—542 **27 Claims**



1. A compression apparatus for forming a compressed grouping of objects, said apparatus comprising:

a. a rotatable body having a peripheral surface including a receiving area positioned on the peripheral surface of said body extending lengthwise along said body for receiving a plurality of objects from an infeed conveyor at a receiving position and rotatable to a transfer position, said rotatable body including two compression members arranged on opposite sides of said rotatable body for compressing said plurality of objects from said opposite sides in said receiving area to form said compressed grouping at said transfer position; and

b. a compression conveyor positioned adjacent said body at a transfer position, said conveyor having compression elements for transporting said compressed grouping away from said transfer position.

US 6,408,603 B1

TAIL SET

Richard Douglas Babuik, 62 Patterson Drive, Regina, Saskatchewan, Canada, S4S 3W9

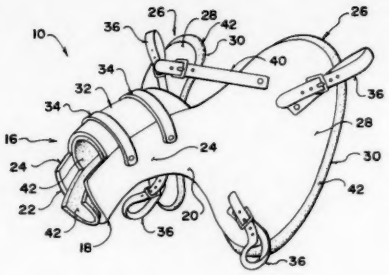
Filed Jun. 27, 2000, Appl. No. 604,396

Int. Cl. B68B *1/00;5/04*

U.S. Cl. 54—78 **20 Claims**

1. A tail set apparatus for supporting a tail of a horse, the apparatus comprising:

a rigid trough having a base along a bottom side thereof arranged to extend longitudinally from a first end to a second end of the trough, the trough including side members extending upwardly from respective sides of the base to extend



longitudinally therewith so as to receive a portion of the tail of the horse extending through the trough from the first end to the second end securely between the respective rigid side members thereof, the trough being arched in the longitudinal direction from the first end to the second end thereof;

a support member having an outer surface mounting the first end of the trough thereon and an inner supporting surface opposite the outer surface, the inner supporting surface being oriented to span transversely to a longitudinal direction of the trough wherein at least a portion of the inner supporting surface is offset laterally outward from each side of the trough and at least a portion of the inner supporting surface is offset vertically from the first end of the trough so as to support the trough on a rear end of the horse to project outwardly therefrom when the inner supporting surface is engaged on the rear end of the horse;

a cap being arranged to be supported on the trough spaced from the base and spanning the side members so as to secure the tail of the horse between the cap and the base of the trough, the cap being arched in the longitudinal direction of the trough similarly to the trough for mating engagement with the trough; and

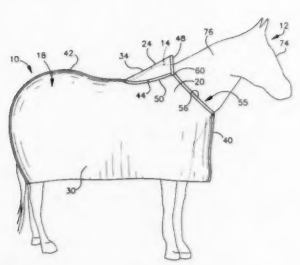
a plurality of strap mounts mounted on the outer surface of the support member, each strap mount being arranged to secure a harness strap thereon wherein at least one strap mount is offset laterally from each side of the trough such that the trough is suspended from the strap mounts therebetween for supporting the trough on the horse.

US 6,408,604 B1

HORSE BLANKET WITH RAISED WITHERS PORTION

Donald P. Schneider, 26600 George Zeiger Dr. #603, Beachwood, Ohio 44122

Filed Aug. 25, 2000, Appl. No. 648,138
Int. Cl. B68C *5/00*
U.S. Cl. 54—79.1 **5 Claims**



1. A horse blanket comprising:

a panel structure having right and left shoulder portions configured to lie upon a horse's shoulders when said blanket is worn by a horse of a size corresponding to the size of said blanket;

said panel structure further having a withers portion between said shoulder portions, said withers portion being configured to have a free-standing condition spaced upward out of overlying contact with the horse's withers when said blanket is thus worn by the horse, whereby said blanket avoids chafing of the withers;

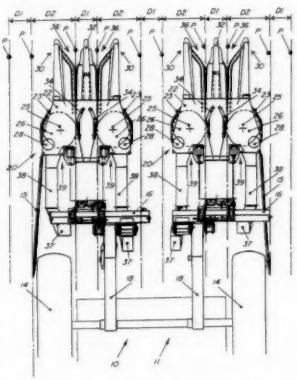
wherein said withers portion of said panel structure comprises a triangular withers panel.

US 6,408,605 B1

COTTON HARVESTER ROW UNIT

Jesse H. Orsborn, Port Byron, Ill.; Kevin S. Richman, Muscatine, Iowa; Monroe C. Barrett, Geneseo, and G. Neil Thedford, Naperville, both of Ill., assignors to Case Corporation, Racine, Wis.

Provisional application No. 60/122,069, filed on Mar. 1, 1999.
This application Feb. 23, 2000, Appl. No. 511,462.
Int. Cl. A01D *46/08*
U.S. Cl. 56—41 **25 Claims**



1. A row unit movable in a forward direction for simultaneously picking cotton from at least two parallel side by side rows of cotton plants, the rows of cotton plants being spaced a predetermined distance apart in a transverse direction relative to the forward direction, the row unit comprising:

a unitary housing having a forward end and an opposite rearward end, the unitary housing containing at least one element disposed between and defining two plant row channels extending forwardly to rearwardly through the housing at locations spaced apart in the transverse direction by an amount about equal to the predetermined distance for simultaneous passage of the at least two side by side rows of cotton plants through the row channels, respectively; and

at least two picker rotors located within the unitary housing adjacent to the plant row channels therethrough, respectively, each of the picker rotors being located across the adjacent plant row channel from the at least one element and mounted for rotation about a generally upright axis and including members which extend into the adjacent plant row channel for picking cotton from the cotton plants passing therethrough as the picker rotor is rotated, each of the picker rotors being positioned and having a predetermined extent in the traverse direction which is sufficient such that the members extend substantially across the adjacent plant row channel so as to be capable of picking cotton from portions of the cotton plants passing therethrough adjacent to the at least one element defining the channel, the at least one element disposed between and defining the two plant row channels being sufficiently narrow in the transverse direction such that the amount the two plant row channels are spaced apart in the traverse direction is less than the predetermined extent of one of the picker rotors.

US 6,408,606 B1

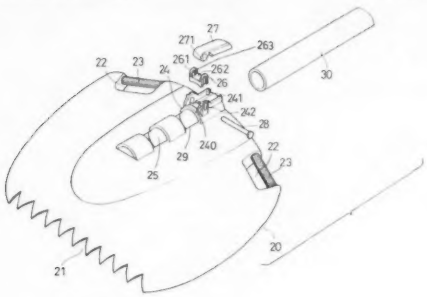
RAKE HAVING DETACHABLE BODY AND HANDLE

Shih Hao Hsu, No. 426, Dou Yuan East Road, Bi Tou Hsiang, Chang Hua Hsien, Taiwan, 523

Filed Jan. 22, 2001, Appl. No. 765,708

Int. Cl. A01D *11/00*

U.S. Cl. 56—400.04 **6 Claims**



1. A rake comprising:

a rake body including at least one hand grip provided therein for holding and operating said rake body, said rake body including a cylindrical member spaced from said hand grip and having a bore formed therein,

a handle including a first end engaged into said bore of said cylindrical member, and

means for detachably securing said rake body to said handle, said detachably securing means including a lever having a cam pivotally secured to said rake body with a pivot shaft, for clamping and securing said handle to said rake body by rotating said lever relative to said rake body.

US 6,408,607 B1

METHOD OF FALSE TWIST TEXTURING A SYNTHETIC YARN TO A CRIMPED YARN

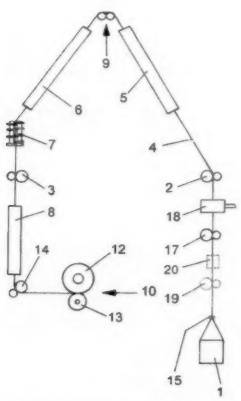
Wolfgang Nölle, Ennepetal, Germany, assignor to Barmag AG, Remscheid, Germany

Filed Jun. 20, 2000, Appl. No. 598,072

Claims priority, application Germany, Nov. 20, 1999, 199 56 008

Int. Cl. D01H *7/92*

U.S. Cl. 57—328 **16 Claims**



1. A method of false twist texturing a synthetic yarn, comprising the steps of:

guiding an advancing yarn through an entanglement nozzle for producing a yarn cohesion,

advancing the yarn from the entanglement nozzle and into a false twist zone at an advancing speed w_1;

heating the yarn within the false twist zone to a temperature T>about 200° C.;

cooling the yarn to a temperature between about 80° to 100° C. within the false twist zone;

producing a false twist in the yarn in the false twist zone which is above a saturation limit of the absorbency of the false twist by the yarn;

withdrawing the yarn from the false twist zone at a speed w_2 so as to draw the yarn in the false twist zone not greater than about 1.4 times the advancing speed w_1; and

winding the yarn to a package.

US 6,408,608 B1

THREAD GUIDING WHEELS

Peter Brian Love, Stourport-on-Severn, and John Davies, Macclesfield, both of United Kingdom, assignors to Morgan Advanced Ceramics Limited, United Kingdom

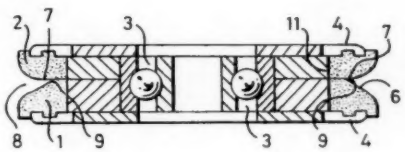
PCT No. PCT/GB98/01941, § 371 Date Dec. 22, 1999, § 102(e) Date Dec. 22, 1999, PCT Pub. No. WO99/01369, PCT Pub. Date Jan. 14, 1999

PCT Filed Jul. 1, 1998, Appl. No. 446,713

Claims priority, application United Kingdom, Jul. 2, 1997, 9714024

Int. Cl. B65H *57/14*

U.S. Cl. 57—352 **12 Claims**



1. A textile machinery thread guiding wheel, the wheel comprising a circumferential slot adapted to receive yarn wherein the circumferential slot is generally V-shaped in section, the V-shape formed by discs wherein (a) a fit disc comprises a substantially flat wall portion and (b) a second disc comprises an at least partially curved surface wall, wherein the substantially flat wall portion of the first disc and the at least partially curved surface wall of the second disc converge to a point at which the walls intersect, the point of the V being sufficient to grip, without yarn gripping structures disposed on the walls, a part of yarn extending about at least a part of the circumference of the wheel.

US 6,408,609 B1

METHOD AND APPARATUS FOR ENHANCING POWER OUTPUT AND EFFICIENCY OF COMBUSTION TURBINES

John S. Andrepont, Naperville, Ill., assignor to Chicago Bridge & Iron Company, Plainfield, Ill.

Filed Jun. 9, 2000, Appl. No. 591,250

Int. Cl. F02C *7/143*

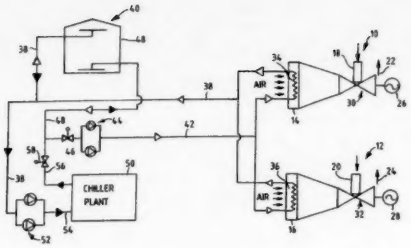
U.S. Cl. 60—39.02 **8 Claims**

1. A method for increasing power output of a combustion turbine, comprising the steps of:

providing a combustion turbine, a storage tank, and a separate refrigeration unit;

storing a fluid other than plain water in the storage tank, in thermally stratified storage;

periodically refrigerating portions of the fluid in the refrigeration unit and providing the refrigerated fluid to the storage tank at a temperature below 4.1° C. (39.4° F.); and



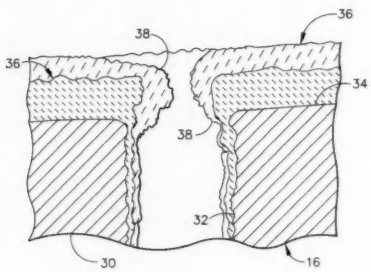
directing portions of the stored fluid to a cooler associated with the combustion turbine.

US 6,408,610 B1

METHOD OF ADJUSTING GAS TURBINE COMPONENT COOLING AIR FLOW

James M. Caldwell, Alexandria, Ky.; Gilbert Farmer, Cincinnati, Ohio; Karl S. Fessenden, Wilder, Ky.; Xuenan Wang, Loveland, and Jerald M. Kauffman, Middletown, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jul. 18, 2000, Appl. No. 618,571
Int. Cl. F02C *7/12*
U.S. Cl. 60—39.02 **11 Claims**



1. A method of adjusting airflow through a plurality of cooling holes extending through a gas turbine engine component from an interior surface of the component to an exterior surface of the component, the method comprising the steps of:

depositing a thermal barrier coating on at least one of the exterior surface and the interior surface of the component by a physical vapor deposition process without masking said plurality of cooling holes thereby permitting a portion of the thermal barrier coating to partially obstruct airflow through said plurality of cooling holes and reducing airflow through said plurality of cooling holes;

developing a predetermined pressure drop across said plurality of cooling holes after depositing the thermal barrier coating on the component;

calculating airflow through said plurality of cooling holes resulting from the predetermined pressure drop across said plurality of cooling holes;

comparing the calculated airflow through said plurality of cooling holes to a preselected range of desired cooling hole airflows; and

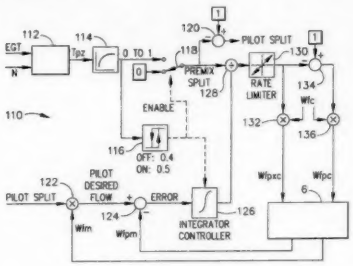
repeating the steps of depositing the thermal barrier coating, developing the predetermined pressure drop, calculating airflow and comparing the calculated airflow to the preselected range until the calculated airflow is within the preselected range of desired cooling hole airflows.

US 6,408,611 B1

FUEL CONTROL METHOD FOR GAS TURBINE

Tim Keller; Mohamad Vhora, both of Albuquerque, N. Mex.; Dan Burnes, Phoenix, and John Lipinski, Tempe, both of Ariz., assignors to Honeywell International, Inc., Morristown, N.J.

Filed Aug. 10, 2000, Appl. No. 635,609
Int. Cl. F02C *9/28*
U.S. Cl. 60—39.03 **18 Claims**



1. A method for controlling the split between premix fuel flow and pilot fuel flow to a combustor in a gas turbine engine comprising the steps of:

a) sensing an operating condition of said engine and generating a first signal thereof;

b) generating a second signal indicative of a desired pilot zone temperature (T_{pz}) in said combustor from said first signal;

c) generating a third signal indicative of a desired split between said premix fuel flow and said pilot fuel flow from said second signal;

d) sensing at least one parameter from which one of either the actual premix fuel flow or actual pilot fuel flow can be determined, and generating a fourth signal indicative of said one of actual premix fuel flow or said actual pilot fuel flow;

e) comparing said fourth signal to said third signal and generating an error signal therefrom; and

f) adjusting the actual premix fuel flow and the actual pilot fuel flow to said combustor until said desired split is substantially reached.

US 6,408,612 B2

GAS AND STEAM-TURBINE PLANT

Frank Hannemann, Spardorf, and Ulrich Schiffers, Eckental, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of application No. PCT/DE99/02058, filed on Jul. 2, 1999. This application Jan. 17, 2001, Appl. No. 761,238.

Claims priority, application Germany, Jul. 17, 1998, 198 32 294

Int. Cl. F02C *6/18*
U.S. Cl. 60—39.12 **7 Claims**

1. A gas and steam-turbine plant, comprising:

a steam turbine having a water/steam circuit;

a gas turbine having a flue-gas side;

a combustion chamber associated with said gas turbine;

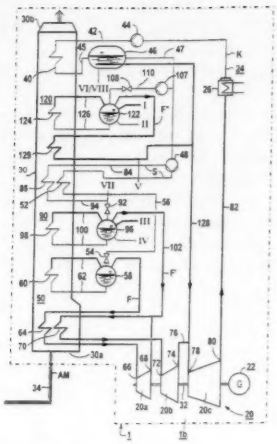
an air compressor associated with said gas turbine for supplying a partial flow of air compressed in said air compressor;

a bleed-air line connected to said air compressor;

an air-separation unit supplying oxygen and having an inlet side connected to said bleed-air line for receiving said partial flow of air compressed in said air compressor;

a heat-recovery steam generator connected downstream of said gas turbine on said flue-gas side, said steam generator having heating surfaces connected in said water/steam circuit;

a gasifier for fuel, said gasifier connected upstream of said combustion chamber and receiving oxygen from said air-separation unit;



a water/steam drum; and

a heat exchanger constructed as an evaporative cooler for cooling said partial flow of compressed air, said heat exchanger having a primary side connected to said bleed-air line and a secondary side connected to said water/steam drum to form an evaporator circuit for a flow medium.

US 6,408,613 B1

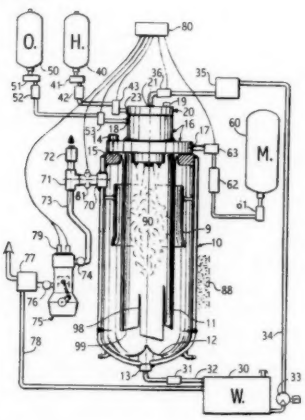
HIGH TEMPERATURE, HIGH PRESSURE VAPORIZER TO POWER A MULTI-CYLINDER EXPANSION ENGINE

John B. Shaw, 1812 E. Marlette Ave., Phoenix, Ariz. 85016

Filed Apr. 20, 2001, Appl. No. 839,627

Int. Cl. F02C *5/00*

U.S. Cl. 60—39.6 **4 Claims**



1. A vaporizer for use with a multi-cylinder expansion engine, comprising a heavy walled high pressure heavily insulated combustion chamber closed at its top flange by a fuel jet header mounting a water-jet nozzle with fuel igniters, the header clamping a replaceable open ended vaporization cylinder that confines and directs an internal combustion flame creating vaporized gasses flowing downwardly in the vaporization cylinder until a deflector-cone, mounted on the bottom of the combustion chamber, below the lower end of the vaporizer tube, redirects the gasses upwardly between the exterior of the vaporization cylinder and the interior of the combustion chamber through a barrier supported constricting collar, the constricting collar extracting excess heat from the exterior of the vaporization cylinder adjacent to the interior flame area, the gasses exiting near the top of the combustion chamber to flow to said expansion engine to do useable shaft-work.

US 6,408,614 B1

HIGH-POWER PRESSURE WAVE SOURCE

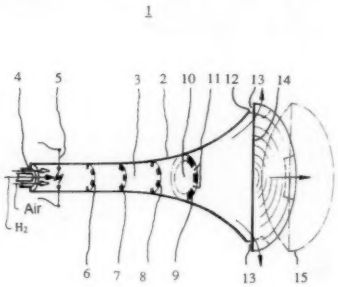
Harald Eizenhöfer, Seefeld, Germany, assignor to Dornier Medizintechnik GmbH, Wessling, Germany

Filed Mar. 10, 1998, Appl. No. 37,952

Claims priority, application Germany, Mar. 11, 1997, 197 09 918

Int. Cl. F02K *7/02*; **F23R** *7/00*

U.S. Cl. 60—200.1 **9 Claims**



1. A high-power pressure wave source for generating individual, high-energy pressure waves that can be repeated at short intervals of time, each time by igniting a defined volume of a combustible fluid mixture as well as by increasing its rate of combustion up to detonation, the pressure wave source comprising:

a channel of a defined length, which expands in cross section toward one of its two ends and forms a combustion chamber, one of said two ends being a narrow end and the other of said two ends being a wide end;

a feed means for feeding components of the fluid mixture;

an igniting means, in the area of the narrow end of the channel, for igniting the fluid mixture;

a discharge means for the waste gas in the area of said wide end of said channel;

a membrane which closes the wide end of the channel on the front side and forms an acoustic transmission element; and

a plurality of vortex generators distributed over the length of the channel.

US 6,408,615 B1

METHOD FOR CONTROLLING AN NO_x ACCUMULATING CATALYTIC CONVERTER

Hermann Hahn, Lehre, Germany, assignor to Volkswagen AG, Germany

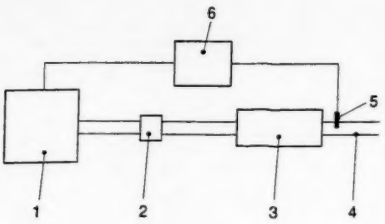
Continuation of application No. PCT/EP99/00864, filed on Feb. 10, 1999. This application Aug. 16, 2000, Appl. No. 641,416.

Claims priority, application Germany, Feb. 27, 1998, 198 08 382

Int. Cl. F01N *3/00*

U.S. Cl. 60—274 **6 Claims**

1. A method for determining the start and the end of a regeneration interval for an NOx accumulating catalytic converter for an engine that can arranged to be run on a lean fuel-air mixture, wherein regeneration is accomplished by periodically operating said engine on a rich fuel-air mixture for said regeneration interval, and wherein there is provided an NOx sensor downstream of the NOx accumulating catalytic converter that has a cross-sensitivity to at least one exhaust-gas product that is a reducing constituent of



the exhaust gas, comprising determining the start of the regeneration phase of the NOx accumulator of the catalytic converter by detecting an NOx content with the sensor and determining the end of the regeneration phase of the catalytic converter by detecting the reducing constituent with the sensor.

US 6,408,616 B1

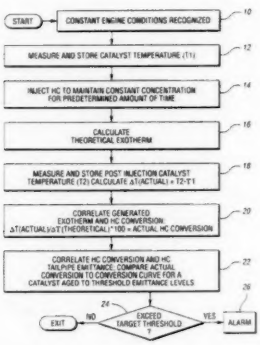
DIESEL OBD-II SYSTEM FOR DETECTION OF DEGRADATION OF CATALYST ACTIVITY

Christopher John Mazur; Paul Matthew Laing, both of Canton, and Robert Henry Hammerle, Franklin, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Jul. 20, 2000, Appl. No. 621,303

Int. Cl. F01N *3/00*

U.S. Cl. 60—277 **10 Claims**



1. A method of on-board vehicle monitoring the performance of a catalyst treating the exhaust stream of a diesel engine, comprising a sequence of the following steps:

detecting a predetermined engine operating condition;

determining the catalyst inlet temperature;

introducing reductant from a secondary fuel supply into the exhaust stream after combustion of fuel by said engine in order to maintain a substantially constant concentration of hydrocarbon in the exhaust stream over a predetermined interval of time;

calculating a theoretical exotherm based on said substantially constant hydrocarbon concentration;

determining the catalyst outlet temperature;

calculating the actual exotherm based on the difference between the catalyst input temperature prior to introduction of said reductant and the catalyst output temperature at the end of said predetermined time interval;

calculating a current hydrocarbon conversion value from said actual and theoretical exotherms;

comparing the hydrocarbon conversion value to a value indicative of a target threshold emittance level; and

providing an indication when said target threshold emittance level is exceeded.

US 6,408,617 B1

DIAGNOSTIC EQUIPMENT FOR AN EXHAUST GAS CLEANING APPARATUS

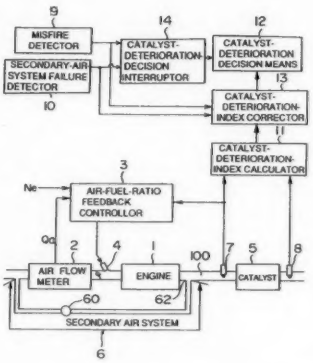
Yutaka Takaku, Katsuta, and Toshio Ishii, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of application No. 09/598,054, filed on Jun. 21, 2000, which is a continuation of application No. 09/282,148, filed on Mar. 31, 1999, now Pat. No. 6,089,016, which is a division of application No. 08/795,142, filed on Feb. 7, 1997, now Pat. No. 5,921,078, which is a continuation of application No. 08/224,881, filed on Apr. 8, 1994, now Pat. No. 5,743,085. This application Oct. 24, 2001, Appl. No. 983,476.

Claims priority, application Japan, Apr. 9, 1993, 5-83326

Int. Cl. F01N *3/00*

U.S. Cl. 60—277 **3 Claims**



1. A diagnostic equipment for an exhaust gas cleaning apparatus for an engine system having an air-fuel-ratio controller which detects an air fuel ratio of exhaust gas emitted from an engine and which adjusts a quantity of fuel injection so as to hold the air fuel ratio of the exhaust gas at a predetermined value, and cleaning said exhaust gas with a catalyst, comprising

a first air-fuel-ratio sensor which detects the air fuel ratio of the exhaust gas upstream of said catalyst;

a second air-fuel-ratio sensor which detects the air fuel ratio of the exhaust gas downstream of said catalyst;

means for calculating a catalyst deterioration index indicative of a deterioration state of said catalyst from output signals of said first air-fuel-ratio sensor and said second air-fuel-ratio sensor;

means using a predetermined threshold value for deciding a deterioration state of said catalyst through a comparison between threshold value and the catalyst deterioration index;

means for detecting abnormality of said engine system affecting said catalyst deterioration index; and

at least one member selected from the group consisting of means for correcting said catalyst deterioration index when the abnormality has been detected by said abnormality detection means, and means for interrupting a decision of said catalyst-deterioration decision means when the abnormality has been detected by said abnormality detection means, wherein

said catalyst-deterioration-index correction means alters a correction coefficient used for correction in accordance with at least one of a temperature of the catalyst and operating conditions, when said catalyst deterioration index is corrected, and

said catalyst-deterioration-decision interruption means alters a standard for interrupting said decision in accordance with at least one of said temperature of the catalyst and said operating conditions, when said decision is interrupted.

US 6,408,618 B2

CONTROLLER FOR CYLINDER CUT-OFF TYPE INTERNAL COMBUSTION ENGINE

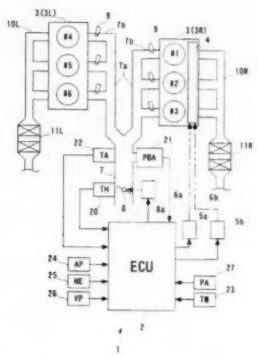
Yutaka Ide, Saitama-ken, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 2001, Appl. No. 774,630

Claims priority, application Japan, Feb. 17, 2000, 2000-040003

Int. Cl. F01N *3/00*

U.S. Cl. 60—285 **2 Claims**



1. A controller for a cylinder cut-off type internal combustion engine which is switched between a full cylinder operation in which a plurality of cylinders are all operated and a partial cylinder operation in which some of said plurality of cylinders are prohibited from operating, said cylinder cut-off internal combustion engine having first and second catalysts provided respectively in two exhaust systems independent of each other for purifying exhaust gas from said some cylinders and from the remaining cylinders respectively, said controller comprising:

catalyst temperature detecting means for detecting a temperature of said first catalyst; and

partial cylinder operation disabling means for disabling said partial cylinder operation when the detected temperature of said first catalyst is lower than a predetermined temperature.

US 6,408,619 B1

METHOD AND DEVICE FOR REDUCING THE NITROGEN OXIDES IN THE EXHAUST GAS OF A COMBUSTION SYSTEM

Gerhard Wissler, Sünching; Günther Pajonk, Zapfendorf; Manfred Weigl, Viehhausen, and Lothar Hofmann, Altenkunstadt, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of application No. PCT/DE98/03643, filed on Dec. 11, 1998. This application Jun. 19, 2000, Appl. No. 596,893.

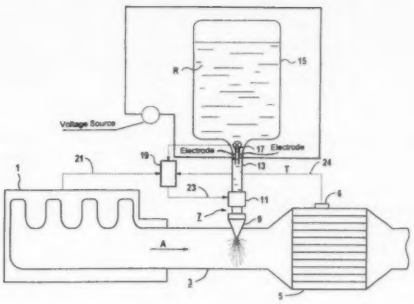
Claims priority, application Germany, Dec. 17, 1997, 197 56 251

Int. Cl. F01N *3/00*

U.S. Cl. 60—286 **9 Claims**

1. A method for catalytically reducing nitrogen oxides in an exhaust gas of a combustion system by reaction of the nitrogen oxides with a reducing agent in a presence of a catalyst, which comprises the following steps:

providing an exhaust gas line and a source of reducing agent, introducing into the exhaust gas line upstream of the catalyst in a flow direction of the exhaust gas an amount of a reducing agent metered in dependence on a concentration of reducing agent in the source and at least one parameter characterizing an operating state of one of the combustion system, the exhaust gas, and the catalyst,



conducting the exhaust gas and the reducing agent over the catalyst, and

wherein said source is a solution of reducing agent in a storage container and the concentration of the reducing agent in said source is determined discontinuously each time said container is filled with the reducing agent solution and not later than when the reducing agent is introduced into the exhaust gas line and adapting the amount to be metered to the concentration determined in the determining step.

US 6,408,620 B2

EXHAUST-GAS CLEANING SYSTEM WITH NITROGEN OXIDE ACCUMULATOR CATALYST AND SULPHUR OXIDE TRAP AND OPERATING METHOD THEREFOR

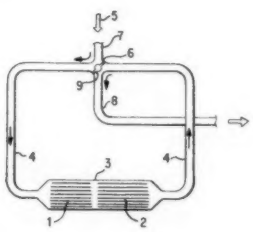
Walter Boegner, Remseck; Josef Günther, Affalterbach; Hans-Peter Holzt, Esslingen; Bernd Krutzsch, Denkendorf; Stefan Renfftlen, Eislingen; Christof Schön, Remshalden; Dirk Voightländer, Korntal-Münchingen; Michel Weibel, and Günter Wenninger, both of Stuttgart, all of Germany, assignors to DaimlerChrylser AG, Stuttgart, Germany

Filed Dec. 15, 2000, Appl. No. 736,418

Claims priority, application Germany, Dec. 15, 1999, 199 60 430

Int. Cl. F01N *3/00*

U.S. Cl. 60—295 **5 Claims**



1. A method for operating an exhaust-gas cleaning system comprising an NO_x adsorption accumulator and an SO_x trap, said method comprising:

in a normal operating phase, passing an exhaust gas first through the SO_x trap and then through the NO_x adsorption accumulator; and

interrupting the normal operating phase from time to time by desulphurization phases for desulphurizing the SO_x traps wherein a desulphurization phase comprises:

passing the exhaust gas first through the NO_x adsorption accumulator and then through the SO_x trap;

feeding secondary air into the exhaust gas downstream of the SO_x trap; and

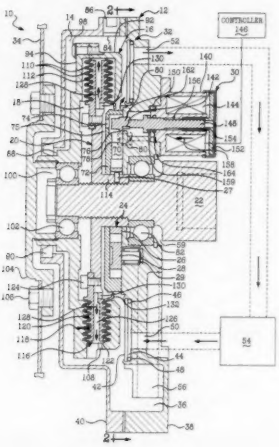
feeding the exhaust gas that is enriched with secondary air to an oxidation catalytic converter.

US 6,408,621 B1

FLUID COUPLING ASSEMBLY

George Moser, Mason, and Gordon Sommer, Plymouth, both of Mich., assignors to Engineered Dynamics Corporation, Plymouth, Mich.

Filed Sep. 11, 2000, Appl. No. 659,684
Int. Cl. F16D *33/00*
U.S. Cl. 60—337 **18 Claims**



1. A fluid coupling assembly comprising:

a stationary housing which forms a first chamber containing an amount of fluid;

a rotatable housing which is disposed within said first chamber and which forms a second chamber which is in fluid communication with said first chamber;

a rotor which is disposed within said second chamber and which is selectively rotatable within said second chamber; and

a pump assembly which is effective to communicate said amount of fluid from said first chamber to said second chamber, thereby causing said amount of fluid to transmit torque from said rotating rotor to said rotatable housing;

wherein said rotor is substantially hollow and includes a channel which is effective to communicate at least a portion of said amount of fluid to said second chamber.

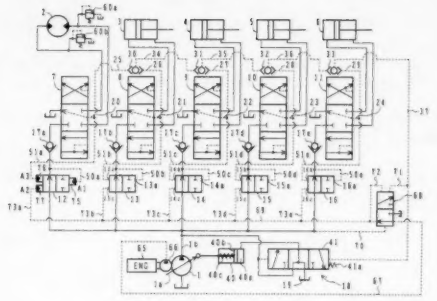
US 6,408,622 B1

HYDRAULIC DRIVE DEVICE

Yasutaka Tsuruga, Ryugasaki; Takashi Kanai, Kashiwa; Junya Kawamoto, Tsuchiura; Satoshi Hamamoto, Toyama-ken; Yasuharu Okazaki, Takaoka, and Yukiaki Nagao, Toyama, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP99/07322, § 371 Date Aug. 24, 2000, § 102(e) Date Aug. 24, 2000, PCT Pub. No. WO00/40865, PCT Pub. Date Jul. 13, 2000
PCT Filed Dec. 27, 1998, Appl. No. 622,957
Claims priority, application Japan, Dec. 28, 1998, 10-374001
Int. Cl. F15B *13/06*
U.S. Cl. 60—422 **6 Claims**

1. A hydraulic drive system comprising a hydraulic pump, a plurality of actuators, including a swing motor, which are driven by a hydraulic fluid delivered from said hydraulic pump, a plurality of directional control valves for controlling respective flow rates of the hydraulic fluid supplied from said hydraulic pump to said plurality of actuators, a plurality of pressure compensating valves for controlling respective differential pressures across said plurality of directional control valves, and pump control means for load sensing control to control a pump delivery rate such that a delivery



pressure of said hydraulic pump is held at a predetermined value higher than a maximum load pressure among said plurality of actuators,

wherein said hydraulic drive system further comprises target compensation differential-pressure setting means provided respectively in said plurality of pressure compensating valves and setting, as a target compensation differential pressure, a differential pressure between the delivery pressure of said hydraulic pump and a maximum load pressure among said plurality of actuators, and

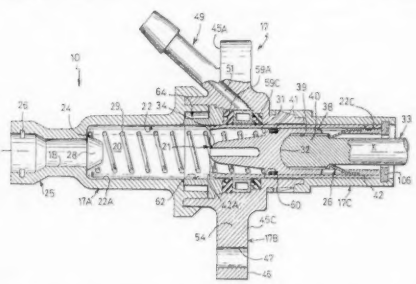
target compensation differential-pressure modifying means provided in one pressure compensating valve of said plurality of pressure compensating valves, which is associated with a swing section including said swing motor, for giving the pressure compensating valve for the swing section such a load dependent characteristic that when the load pressure of said swing motor rises, the target compensation differential pressure of the pressure compensating valve for the swing section, which is set by the target compensation differential-pressure setting means, is reduced to provide a flow rate characteristic simulating a constant-horsepower control to maintain a horsepower outputted in a steady operating state of said swing motor.

US 6,408,623 B1

SIMPLIFIED HYDRAULIC CONTROL DEVICE FOR A CLUTCH, ESPECIALLY FOR AN AUTOMOBILE

Christophe Mollier, Herblay, and Pasquale Angione, Paris, both of France, assignors to Valeo, Paris, France

PCT No. PCT/FR00/01520, § 371 Date Feb. 5, 2001, § 102(e) Date Feb. 5, 2001, PCT Pub. No. WO00/04989, PCT Pub. Date Dec. 14, 2000
PCT Filed May 31, 2000, Appl. No. 762,251
Claims priority, application France, Jun. 4, 1999, 99 07112
Int. Cl. B60T *11/26;* **F01B** *11/02*
U.S. Cl. 60—588 **21 Claims**



1. Hydraulic control apparatus (**10**) for a clutch comprising at least one cylinder having a cylinder body (**17**) which includes a base portion (**24**) at a front, and which is open at the rear and has an internal bore (**22**) in which a piston (**21**, **42**) is mounted for axial

sliding movement, with at least one dynamic sealing ring (**59**A, **59**C) being interposed and being carried by the body of the cylinder (**17**, **17**B) for cooperation with an outer periphery (**42**) of the piston (**21**), in which the piston (**21**) has a front face (**31**) defining a hydraulic chamber (**20**) and a rear face (**32**) cooperating with a piston rod (**33**), and in which the cylinder body (**17**) includes, arranged in consecutive axial succession from front to rear, at least one blind front part (**17**A) which includes said base portion (**24**), and a central part (**17**B) which carries said at least one sealing ring, said parts being fixed together sealingly, and in which said internal bore includes two portions for guiding the piston (**21**, **42**) in axial sliding movement, namely a front portion and a rear portion substantially coaxial and concentric with each other, wherein the front portion (**62**) and rear portion (**60**) for guiding the piston (**21**, **42**) in sliding movement are comprised in the central part (**17**B, **64**) of the cylinder body, and

wherein a centering sleeve (**64**) is attached in the central part (**17**B, **22**B) by axial introduction from front to rear.

2. Hydraulic control apparatus (**10**) for a clutch comprising at least one cylinder having a cylinder body (**17**) which includes a base portion (**24**) at a front, and which is open at the rear and has an internal bore (**22**) in which a piston (**21**, **42**) is mounted for axial sliding movement, with at least one dynamic sealing ring (**59**A, **59**C) being interposed and being carried by the body of the cylinder (**17**, **17**B) for cooperation with an outer periphery (**42**) of the piston (**21**), in which the piston (**21**) has a front face (**31**) defining a hydraulic chamber (**20**) and a rear face (**32**) cooperating with a piston rod (**33**), and in which the cylinder body (**17**) includes, arranged in consecutive axial succession from front to rear, at least one blind front part (**17**A) which includes said base portion (**24**), and a central part (**17**B) which carries said at least one sealing ring, said parts being fixed together sealingly, and in which said internal bore includes two portions for guiding the piston (**21**, **42**) in axial sliding movement, namely a front portion and a rear portion substantially coaxial and concentric with each other, wherein the front portion (**62**) and rear portion (**60**) for guiding the piston (**21**, **42**) in sliding movement are comprised in the central part (**17**B, **64**) of the cylinder body, and

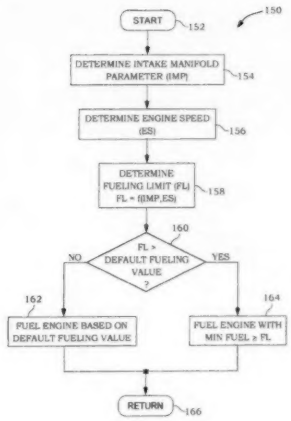
wherein a central guide sleeve (**64**) is attached in the central part (**17**B, **22**B), said central guide sleeve is formed with a tubular portion (**90**) that extends from a main body of the guide sleeve to define a rear guide portion (**62**).

3. Hydraulic control apparatus (**10**) for a clutch comprising at least one cylinder having a cylinder body (**17**) which includes a base portion (**24**) at a front, and which is open at the rear and has an internal bore (**22**) in which a piston (**21**, **42**) is mounted for axial sliding movement, with at least one dynamic sealing ring (**59**A, **59**C) being interposed and being carried by the body of the cylinder (**17**, **17**B) for cooperation with an outer periphery (**42**) of the piston (**21**), in which the piston (**21**) has a front face (**31**) defining a hydraulic chamber (**20**) and a rear face (**32**) cooperating with a piston rod (**33**), and in which the cylinder body (**17**) includes, arranged in consecutive axial succession from front to rear, at least one blind front part (**17**A) which includes said base portion (**24**), and a central part (**17**B) which carries said at least one sealing ring, said parts being fixed together sealingly, and in which said internal bore includes two portions for guiding the piston (**21**, **42**) in axial sliding movement, namely a front portion and a rear portion substantially coaxial and concentric with each other, wherein the front portion (**62**) and rear portion (**60**) for guiding the piston (**21**, **42**) in sliding movement are comprised in the central part (**17**B, **64**) of the cylinder body, and wherein the rear guide portion (**60**) is formed directly in the central part (**17**B) of the cylinder body (**17**), and in that the front guide portion (**62**) is formed in an internal central guide sleeve (**64**) attached in the central part (**17**B).

US 6,408,624 B1
SYSTEM FOR CONTROLLING TRANSIENT COMPRESSOR SURGE IN A TURBOCHARGED INTERNAL COMBUSTION ENGINE

Martin T. Books, and Glenn L. Baker, both of Columbus, Ind., assignors to Cummins, Inc., Columbus, Ind.

Filed Jan. 29, 2001, Appl. No. 771,754
Int. Cl. F02D *23/00*
U.S. Cl. 60—601 **19 Claims**



1. A system for controlling transient compressor surge in a turbocharged internal combustion engine, comprising:

a turbocharger including a turbocharger compressor fluidly coupled to a cylinder of an internal combustion engine via an intake manifold;

means for determining an operating condition of said intake manifold and producing an intake manifold parameter signal corresponding thereto;

a fuel system responsive to a fueling command to supply fuel to said engine; and

a control circuit maintaining said fueling command above a minimum fueling limit based at least on said intake manifold parameter signal to avoid turbocharger transient compressor surge.

US 6,408,625 B1
OPERATING TECHNIQUES FOR INTERNAL COMBUSTION ENGINES

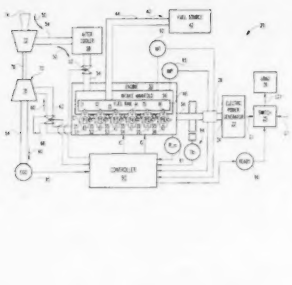
Peter V. Woon; Axel O. Zur Loye; Larry J. Brackney; Jay F. Leonard; Eric K. Bradley; Terry M. Vandenberghe; Jacqueline M. Yeager; Julie A. Wagner, all of Columbus, and Greg A. Moore, Grammer, all of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

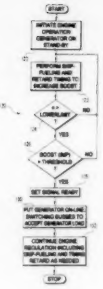
Provisional application No. 60/116,620, filed on Jan. 21, 1999. This application Jan. 19, 2000, Appl. No. 487,526.
Int. Cl. F02B *33/44;* **F02N** *11/06*
U.S. Cl. 60—608 **46 Claims**

1. A method of generating electric power, comprising:

starting an internal combustion engine having a number of combustion chambers and a turbocharger, the engine being a prime mover for an electric power generator, the chambers each having a respective fueling period;

preparing the engine to accept a generator load by withholding fuel during the respective fueling period of a portion of the chambers to increase boost pressure provided with the turbocharger; and



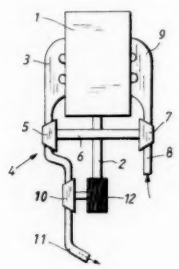


driving the generator with the engine, the engine accepting the generator load after increasing the boost pressure during said preparing.

US 6,408,626 B1
ARRANGEMENT AND METHOD FOR POWER TRANSMISSION IN COMBUSTION ENGINES

Jan Arnell, Hisings Kärra, Sweden, assignor to AB Volvo, Sweden

PCT No. PCT/SE97/00695, § 371 Date Oct. 28, 1998, § 102(e) Date Oct. 28, 1998, PCT Pub. No. WO97/41338, PCT Pub. Date Nov. 6, 1997
PCT Filed Apr. 25, 1997, Appl. No. 171,992
Claims priority, application Sweden, Apr. 29, 1996, 96016563
Int. Cl. F02B *37/04;* **F02G** *3/00*
U.S. Cl. 60—624 **13 Claims**



1. An apparatus for transmission of power in a combustion engine producing an exhaust gas stream and including a crankshaft, said apparatus comprising at least one device for absorbing energy from said exhaust gas stream, and power transmission means for transferring power from said at least one device to said crankshaft, said power transmission means including a viscous medium whereby said power is transferred to said crankshaft by means of shearing forces of said viscous medium.

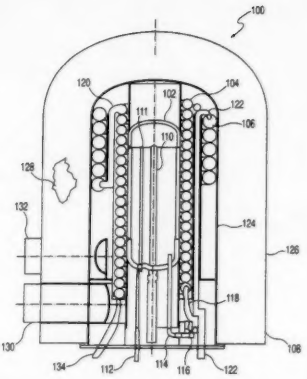
US 6,408,627 B1
INTEGRATED CONTINUOUS POWER SYSTEM ASSEMBLIES

William D. Batton, Arvada; Kevin Hotton, Broomfield; Gary Frey, Morrison, and Gail Roberts, Arvada, all of Colo., assignors to Active Power, Inc., Austin, Tex.

Filed May 21, 2001, Appl. No. 861,961
Int. Cl. F01K *13/02*
U.S. Cl. 60—646 **31 Claims**

1. A continuous power system accumulator assembly comprising:

a housing;



a container operable to store liquid working fluid, said container being mounted within said housing;

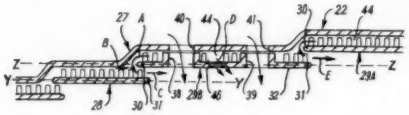
an energy conversion device mounted in thermal contact with said container, said energy conversion device being operable to convert said liquid working fluid into working vapor; and

a heating device mounted in said container, being operable to add thermal energy to said liquid working fluid, said container, and said energy conversion device.

US 6,408,628 B1
WALL ELEMENTS FOR GAS TURBINE ENGINE COMBUSTORS

Anthony Pidcock, Chellaston; Desmond Close, and Michael P. Spooner, both of Derby, all of United Kingdom, assignors to Rolls-Royce plc, London, United Kingdom

Filed Nov. 2, 2000, Appl. No. 703,666
Claims priority, application United Kingdom, Nov. 6, 1999, 9926257
Int. Cl. F02C *1/00;* **F02G** *3/00*
U.S. Cl. 60—752 **31 Claims**



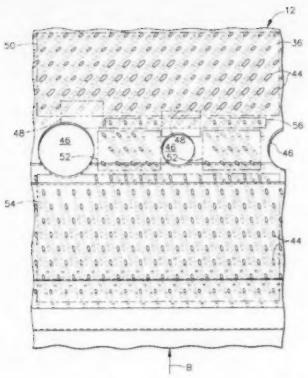
1. A wall element for a wall structure of a gas turbine engine combustor with the engine having a principal axis, the wall element comprising a base portion having an axis which in use, extends generally parallel to the principal axis of the engine, wherein the dimension of said wall element parallel to said axis thereof is greater then substantially 20% of the dimension of the wall element transverse to said axis of the wall element, and the base portion includes a plurality of rows of mixing ports to allow gas to enter the combustor in use.

US 6,408,629 B1
COMBUSTOR LINER HAVING PREFERENTIALLY ANGLED COOLING HOLES

Tariq Kay Harris, Cincinnati, and Michael Burke Briski, Hamilton, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

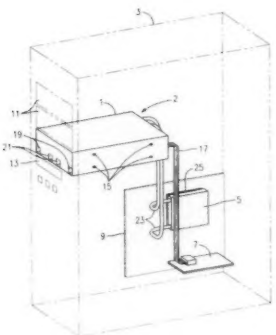
Filed Oct. 3, 2000, Appl. No. 678,069
Int. Cl. F02C *3/04*
U.S. Cl. 60—804 **16 Claims**

1. An annular combustor liner defining an axis and having a plurality of cooling holes formed therein, said cooling holes



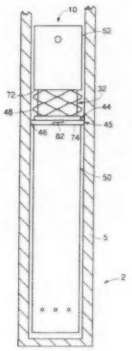
including a first group of cooling holes angled with respect to said axis in a first circumferential direction and a second group of cooling holes angled with respect to said axis in a second circumferential direction, opposite to said first circumferential direction.

US 6,408,630 B2
COMPUTER ENCLOSURE COOLING UNIT
Jose Javier Macias, 1138 Highland Dr., Grand Prairie, Tex. 75051, and Rogelio Hernandez Silva, 2508 N. Forty Cr. #111, Arlington, Tex. 76006
Continuation of application No. 09/434,873, filed on Nov. 4, 1999, now Pat. No. 6,196,003. This application Jan. 9, 2001, Appl. No. 756,896.
This patent is subject to a terminal disclaimer.
Int. Cl. F25B *21/02*; **H05K** *7/20*
U.S. Cl. 62—3.7 **11 Claims**



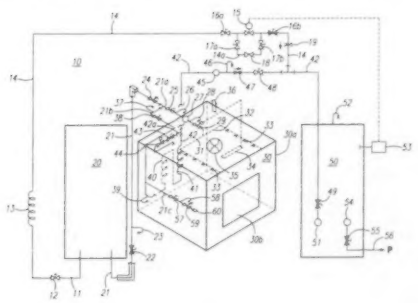
1. An enclosure cooling unit which comprises
a first heat exchanger,
a second heat exchanger,
a third heat exchanger, and
one or more Peltier devices;
wherein
said first heat exchanger transfers heat from said enclosure cooling unit to the ambient air outside said enclosure,
said second heat exchanger transfers heat from the air within said enclosure to said enclosure cooling unit,
said third heat exchanger transfers heat from cooling fluid circulating within said enclosure to said ambient air,
said one or more Peltier devices transfer heat from said second heat exchanger to said first heat exchanger, and
said one or more Peltier devices transfer heat from said second heat exchanger to said third heat exchanger.

US 6,408,631 B1
WAVE SPRING LOADED SPLIT SEAL SYSTEM
Russell Sylvia, South Dartmouth, Mass., assignor to Helix Technology Corporation, Mansfield, Mass.
Filed Feb. 9, 2001, Appl. No. 780,026
Int. Cl. F25B *9/00*
U.S. Cl. 62—6 **47 Claims**



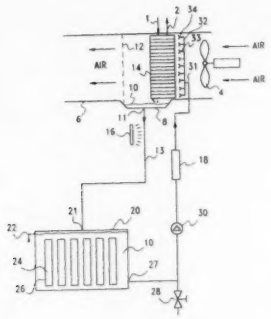
1. A piston comprising:
a body having a circumferential groove, the groove having a first groove wall and a second groove wall;
a seal ring located against the first groove wall in the body; and
a wave spring located between the seal ring and the second groove wall, the wave spring axially loading the seal ring.

US 6,408,632 B1
FREEZER AND PLANT GAS SYSTEM
Michael D. Cashin, 333 S. Indiana St., Anaheim, Calif. 92805
Filed Jun. 28, 2000, Appl. No. 605,770
Int. Cl. F25B *19/00*
U.S. Cl. 62—51.1 **5 Claims**



1. A plant gas system comprising
a liquid cryogen storage tank,
a freezer comprising a first evaporator located within said freezer, said freezer and first evaporator being in communication with said liquid storage tank,
a gas reservoir in communication with said first evaporator, and
a second evaporator connected in series with said first evaporator, said second evaporator being located external to said freezer.

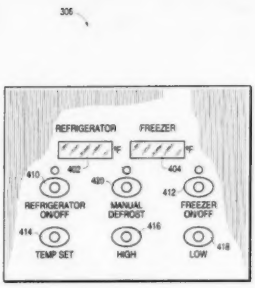
US 6,408,633 B1
INTERFACING OF THERMAL STORAGE SYSTEMS WITH AIR CONDITIONING UNITS
Peter Carr, Cary, N.C., assignor to Instatherm Company, Cary, N.C.
Provisional application No. 60/223,816, filed on Aug. 8, 2000. This application Aug. 7, 2001, Appl. No. 923,843.
Int. Cl. F25D *11/00;17/02;* **F28D** *5/00*
U.S. Cl. 62—99 **71 Claims**



1. A method for cooling an air stream comprising the steps of:
providing a thermal storage reservoir having an inlet and an outlet, said reservoir comprising a thermal storage mass;
providing a thermally conductive heat exchanger having a heat exchanger inlet and a heat exchanger outlet, said heat exchanger inlet and heat exchanger outlet directing an airflow through the heat exchanger;
providing a primary water loop having an amount of water directed through a conduit, said conduit in communication with the thermal storage reservoir;
providing a fluid disperser having a disperser inlet and a disperser outlet, said disperser inlet in communication with the conduit such that water in the water loop is directed from the reservoir to the disperser inlet;
dispersing water from the conduit through the disperser outlet and onto an outer surface of the heat exchanger;
reclaiming water from the surface of the heat exchanger and directing the reclaimed water to the reservoir; and
providing said airflow having a first temperature in the direction of the heat exchanger and past the heat exchanger such that the air after passing the heat exchanger has a second temperature lower that the first temperature.

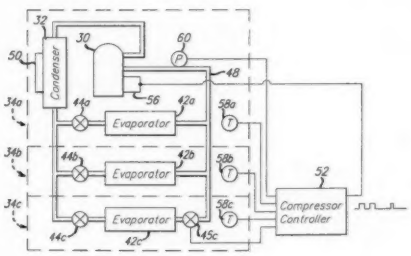
US 6,408,634 B1
MULTI-CHAMBER REFRIGERATION SYSTEM UTILIZING A SINGLE COMPRESSOR AND DIGITAL TEMPERATURE CONTROLS
Tai Choi, Lafayette, Calif., assignor to Jimex Corporation, Alameda Point, Calif.
Filed Aug. 17, 2000, Appl. No. 641,558
Int. Cl. F25D *21/06*
U.S. Cl. 62—127 **17 Claims**

1. A refrigeration unit comprising:
a first refrigeration compartment within a housing;
a second refrigeration compartment within the housing and mechanically coupled to the first refrigeration compartment;
a control unit electrically coupled to the first refrigeration unit and the second refrigeration compartment;
a compressor coupled to the control unit through a first solenoid valve and through a second solenoid valve, the first solenoid valve operable to alter an operating temperature of the first refrigeration compartment, and the second solenoid valve operable to alter an operating temperature of the second refrigeration compartment; and



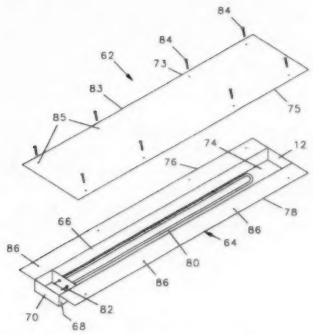
a manual defrost circuit coupled to the control unit and operable to activate a defrost cycle of the refrigeration unit upon manual input of a defrost command by a user.

US 6,408,635 B1
ADAPTIVE CONTROL FOR A REFRIGERATION SYSTEM USING PULSE WIDTH MODULATED DUTY CYCLE SCROLL COMPRESSOR
Hung M. Pham, Dayton, Ohio; Abtar Singh, Kennesaw, Ga.; Jean-Luc M. Caillat, Dayton, and Mark Bass, Sidney, both of Ohio, assignors to Copeland Corporation, Sidney, Ohio
Division of application No. 08/939,779, filed on Sep. 29, 1997, now Pat. No. 6,047,557, which is a continuation-in-part of application No. 08/486,118, filed on Jun. 7, 1995, now Pat. No. 5,741,120. This application Mar. 14, 2000, Appl. No. 524,364.
Int. Cl. F25B *41/04*
U.S. Cl. 62—222 **15 Claims**



1. A refrigeration system comprising,
a refrigeration case;
an evaporator disposed in said case;
a condenser and compressor coupled in fluid communication with said evaporator;
said condenser being disposed on said case and having means for transferring heat to ambient;
said compressor comprising a pulse width modulated variable capacity compressor;
a load sensor disposed in said case;
a controller responsive to said load sensor and coupled to said compressor for providing a variable duty cycle control signal to said compressor whereby said compressor is modulated between loaded and unloaded states while operating to thereby adjust the operating capacity of the refrigeration system to its thermal load; and
a refrigerant regulator valve in fluid communication with said evaporator and being electrically controlled by said variable duty cycle control signal to further adjust the capacity of said refrigeration system.

US 6,408,636 B1
METHOD AND APPARATUS FOR PREVENTING ICE BUILD UP AROUND A FREEZER DOOR
Larry Backes, 536 W. McKinley, Libertyville, Ill. 60048, and Chris Butz, 4 N. 603 Ridgewood, Bensenville, Ill. 60106
Filed Oct. 16, 2000, Appl. No. 688,519
Int. Cl. F25D *21/06*
U.S. Cl. 62—275 **9 Claims**



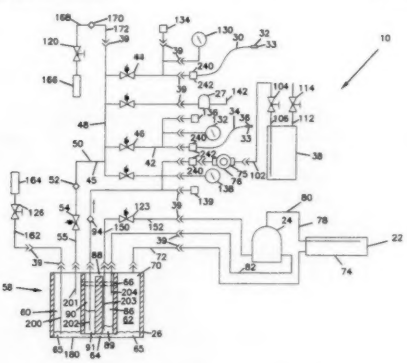
1. The method of preventing a build up of ice on the perimeter of the doorway of a freezer, said freezer having a floor, a door moveable between an open position and a closed position, said doorway defined by a pair of opposing side surfaces, an upper surface and a threshold surface, said doorway having an inner flexible barrier to retain cold air within said freezer while said door is in said open position, said method comprising

providing a heating element,

positioning said heating element to heat a column of air between an inner surface of said closed door and said flexible barrier to maintain said surfaces of said doorway at above freezing temperatures, and

applying heat from said heating element continuously, when said door is in said open position and in said closed position.

US 6,408,637 B1
APPARATUS AND METHOD FOR RECOVERING AND RECYCLING REFRIGERANT
Arnold M. Hanson, Minneapolis; Badr Alossaimi, Prior Lake, and Thomas D. Chandler, Coon Rapids, all of Minn., assignors to Century Mfg. Co., Bloomington, Minn.
Filed Nov. 1, 1999, Appl. No. 430,842
Int. Cl. F25B *45/00*
U.S. Cl. 62—292 **9 Claims**



1. An apparatus for recovering and recycling refrigerant comprising:

separation unit for condensing compressed refrigerant and for vaporizing contaminated refrigerant, the separation unit comprising a multichamber structure including:

(i) high pressure region having high pressure inlet for providing compressed refrigerant vapor to the high pressure region, high pressure outlet for removing condensed refrigerant from the high pressure region, and compressor oil outlet for removing compressor oil from the high pressure region; and

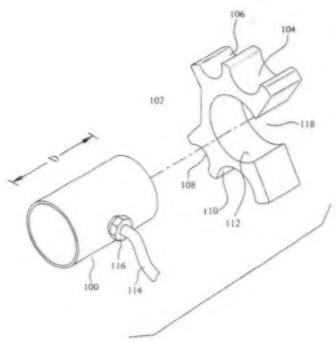
(ii) low pressure region having low pressure inlet for introducing contaminated refrigerant into the low pressure region, low pressure outlet for removing vaporized refrigerant from the low pressure region, and refrigerant oil outlet for removing refrigerant oil from the low pressure region;

filter for filtering contaminated refrigerant prior to introduction into said separation unit, the filter comprises a magnet;

compressor for compressing refrigerant from the low pressure outlet of said separation unit to provide compressed refrigerant for feeding to the high pressure inlet of said separation unit; and

receiver tank for receiving condensed refrigerant from the high pressure outlet of said separation unit.

US 6,408,638 B1
PIPE FREEZER WITH QUICK CONNECT EVAPORATOR HEADS
Limin Chen, Melville, N.Y., assignor to Spectronics Corporation, Westbury, N.Y.
Filed Aug. 2, 2001, Appl. No. 921,353
Int. Cl. F25D *3/00*
U.S. Cl. 62—293 **13 Claims**



1. An apparatus for freezing the contents of a pipe through the use of a refrigeration cycle, comprising:

(a) a portable condenser/compressor unit;

(b) a pair of flexible coaxial hoses connected to the condenser/compressor unit, each hose having an inner tube for the delivery of high pressure liquid refrigerant to an evaporation chamber and an outer tube for the return of refrigerant vapor from the evaporation chamber to the condenser/compressor unit;

(c) an evaporation chamber having a length axis;

(d) a plurality of interchangeable adapters, each adapter being constructed of a heat conductive metal and configured with one or more nearly semicircular channels conforming to a standard pipe diameter such that an adapter can be placed along a section of a pipe, each adapter further configured to receive and hold an evaporation chamber in a position wherein the length axis of the evaporation chamber is aligned parallel to the axis of the pipe when the adapter is placed along a section of pipe; and

(e) the evaporation chamber having a hose coupling approximately midway along its length dimension and oriented to

couple the chamber to the hose in a orientation such that the inner tube of the hose is directed perpendicular to the length axis of the chamber.

US 6,408,639 B1

DEVICE AND CONVEYOR BELT FOR MAKING PELLETS

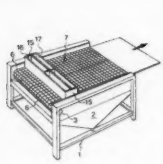
Ulf Jagaeus, Viken, Sweden, assignor to AGA AB, Lidingo, Sweden

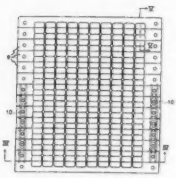
Continuation of application No. PCT/SE99/01310, filed on Jul. 26, 1999. This application Jan. 29, 2001, Appl. No. 770,223.

Claims priority, application Sweden, Jul. 29, 1998, 9802647

Int. Cl. A23G *9/00;* **F25D** *17/02;25/04*

U.S. Cl. 62—345 **10 Claims**





1. A device for making pellets of a material that can be made to solidify by changing its temperature, the device comprising an endless belt (**6**) on which the material is placed at a feeding location and is conveyed along a processing path (**7**) to a guide roller (**4**) at a discharging location, and means (**2**) for changing the temperature of the material on the belt (**6**) along the processing path (**7**), characterized in that the endless belt (**6**) comprises a plurality of lamellae (**9**) having a longitudinal length transverse to a longitudinal direction of the belt, which are articulately juxtaposed along the longitudinal length and have at least one duct (**11**) which extends in length in the longitudinal direction of the belt uninterrupted between adjacent lamella and has, between longitudinal edges of each lamella a ridge (**13**) transverse to the longitudinal direction of the belt of a height smaller than the depth of the duct (**11**).

US 6,408,640 B1

CRYOGENIC REFRIGERATION OF GOODS

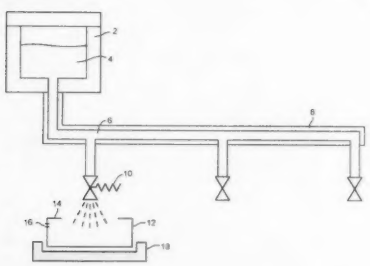
Michael Ernest Garrett, Woking, and Michael John Heywood, Hythe, both of United Kingdom, assignors to The BOC Group, plc, Windlesham, United Kingdom

Filed May 31, 2000, Appl. No. 583,491

Claims priority, application United Kingdom, Jun. 4, 1999, 9913071

Int. Cl. F25D *17/02*

U.S. Cl. 62—373 **10 Claims**



1. An apparatus for refrigerating goods comprising: means for storing a cryogenic fluid; means for distributing the cryogenic fluid from the storage means; and means for containing the goods to be refrigerated, the containing means comprising:

a plurality of compartments,

partitioning means disposed in each one of the plurality of compartments for providing upper and lower chambers in each compartment, said partitioning means constructed and arranged for fluid communication between the upper and lower chambers,

discharge means disposed in each compartment and connected to the distribution means for discharging cryogenic fluid into a corresponding one of the plurality of compartments.

US 6,408,641 B1

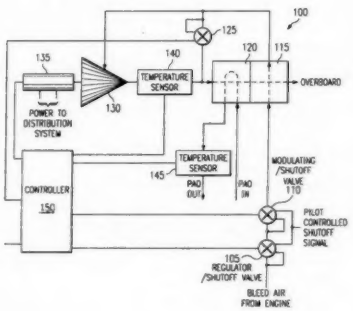
HYBRID TURBINE COOLANT SYSTEM

Anthony I. Skur, III, Aledo, Tex., assignor to Lockheed Martin Corporation, Bethesda, Md.

Filed Mar. 27, 2001, Appl. No. 818,116

Int. Cl. F25D *9/00;* **F28B** *9/00;* **F25B** *9/00*

U.S. Cl. 62—401 **19 Claims**



14. A method of providing chilled liquid coolant, comprising:

extracting bleed air from a propulsion turbine engine;

cooling said bleed air in a heat exchange relationship with reclaimed chilled air, wherein only said reclaimed chilled air is used for said heat exchange relationship cooling of said bleed air;

expanding said cooled bleed air within an expansion turbine thereby producing chilled air;

chilling liquid coolant in a heat exchange relationship with said chilled air; and

circulating said chilled air, subsequent- to chilling said liquid coolant, to provide said reclaimed chilled air for said cooling a portion of said bleed air.

US 6,408,642 B1

APPARATUS AND METHOD FOR DISCHARGING FLUID

John F. Judge, Stewartstown, Pa., assignor to York International Corporation, York, Pa.

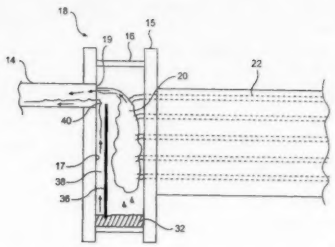
Filed Feb. 8, 2001, Appl. No. 778,887

Int. Cl. F25B *43/02;43/00;* **F28B** *1/00*

U.S. Cl. 62—468 **47 Claims**

1. An apparatus for discharging from an outlet chamber a fluid and a liquid separated from the fluid, the outlet chamber configured to collect the separated liquid, the outlet chamber in fluid communication with an outlet opening disposed on an exit surface of the outlet chamber, comprising:

a plate positionable in the outlet chamber adjacent to the exit surface to form a channel between the plate and the exit surface, the plate configured to protrude over the outlet opening so that the fluid flowing through the outlet chamber and into the outlet opening pulls the liquid collected in the outlet



chamber through the channel and out through the outlet opening with the fluid.

US 6,408,643 B1
ABSORPTION REFRIGERATOR

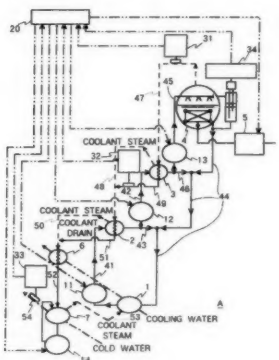
Syuzo Takabatake; Kunihiko Nakajima, both of Otsu; Kenichi Saitou, Funabashi; Hideharui Arai, Kusatsu, and Masuomi Ohta, Moriyama, all of Japan, assignors to Kawasaki Thermal Engineering Co., Ltd., Shiga, Japan

Filed Mar. 22, 2001, Appl. No. 813,865

Claims priority, application Japan, Oct. 23, 2000, 2000-323217

Int. Cl. F25B *15/00*

U.S. Cl. 62—476 **39 Claims**



1. An absorption refrigerator having three-stage regenerators including a low-temperature, medium-temperature and high-temperature regenerators connected in series, comprising: a diluted fluid pump feeding diluted fluid obtained by causing an absorption fluid to absorb a coolant by means of an absorber to the low-temperature regenerator; an intermediate fluid pump feeding an intermediate absorption fluid obtained through heating and concentration of the diluted absorption fluid to the medium-temperature regenerator by means of the low-temperature regenerator; a concentrated-fluid pump feeding a concentrated absorption fluid obtained through heating and concentration of the intermediate absorption fluid in the medium-temperature regenerator to the high-temperature regenerator; an intermediate fluid bypass piping feeding back a part of the intermediate absorption fluid directly to the absorber so as to feed only a prescribed ratio of the intermediate absorption fluid obtained in the low-temperature regenerator to the medium-temperature regenerator by means of the intermediate fluid pump; and a concentrated fluid bypass piping feeding back a part of the concentrated absorption fluid directly to the absorber so as to feed back only a prescribed ratio of the concentrated absorption fluid obtained in the medium-temperature regenerator to the high-temperature regenerator by means of the concentrated fluid pump.

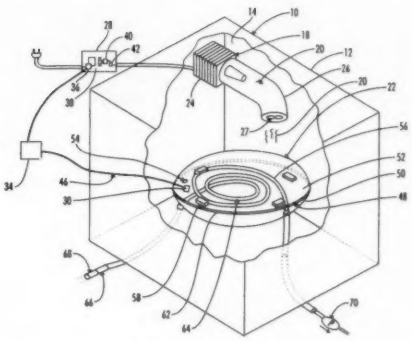
US 6,408,644 B1
MICROWAVE HOME ENERGY HEATING AND COOLING SYSTEM

Don Williams, 552 E. Madison St., Pulaski, Tenn. 38478

Filed Aug. 21, 2000, Appl. No. 643,015

Int. Cl. F25B *33/00*

U.S. Cl. 62—497 **20 Claims**



1. An air conditioning energy reactor for converting electricity to heat for use in an air conditioning system, comprising:

a radio wave generator for converting electricity into radio waves; and

a wave converting target for receiving the radio waves and converting the radio waves into heat, the wave converting system operably placed in association with an air conditioning generator to transfer heat from the converting system to the air conditioning generator.

US 6,408,645 B1
AIR-CONDITIONER, OUTDOOR UNIT AND REFRIGERATION UNIT

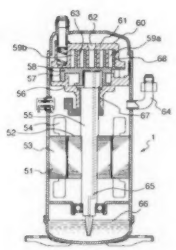
Hiroaki Tsuboe, Shimizu; Susumu Nakayama, Shizuoka; Akira Saruta, Chiba, and Kazumoto Urata, Shizuoka, all of Japan, assignors to Hitachi Air Conditioning Systems, Co. Ltd., Tokyo, Japan, Hitachi, Ltd., Trustee

Continuation of application No. 09/552,585, filed on Apr. 19, 2000. This application Aug. 10, 2001, Appl. No. 925,540.

Claims priority, application Japan, Feb. 14, 2000, 2000-39729

Int. Cl. F25B *31/00*

U.S. Cl. 62—505 **4 Claims**



1. A refrigeration device comprising a motor, a compressor driven by said motor, a condenser and an evaporator, wherein said compressor comprises a scroll compressor and said motor includes a rotor core in which a cage type conductor and permanent magnets magnetized in bipolar state are embedded, said motor operating as an induction motor upon starting and as a synchronous motor during steady operation.

US 6,408,646 B1

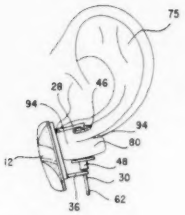
EARRING TO IMPROVE FACIAL APPEARANCE

Maxine Reeves, 100 Temple Blvd., Lufkin, Tex. 75901

Provisional application No. 60/206,435, filed on May 23, 2000. This application May 7, 2001, Appl. No. 849,318.

Int. Cl. A44C *7/00*

U.S. Cl. 63—12 **11 Claims**



1. An earring comprising,

a first portion, said first portion including a circular disk, said circular disk having a first diameter and a first circumference, said circular disk having a first side and a second side, said second side having a riser and a latch, said riser and latch disposed proximal the circumference and 180 degrees apart, said latch having a central slot,

said central slot having a plurality of circular cutouts disposed thereon,

said riser having a first side and a second side, said riser first side hingedly connected to said circular disk second side, and said riser second side connected to an elongated post,

said post adapted to be received in any of said plurality of circular cutouts,

a second portion, said second portion including a second circular disk, said second circular disk having a second diameter and a second circumference, said second circular disk having a first side and a second side, said second side of said second circular disks including a sleeve and said sleeve receiving said first portion first side therein whereby,

said post is adapted to pass through a first aperture in an earlobe and said post is adapted to pass through a second aperture in an earlobe which has been aligned with the first aperture by the earlobe being folded back behind the ear, said post thus being adapted to secure the earlobe behind the ear which has the effect of removing the wrinkles from the face.

US 6,408,647 B1

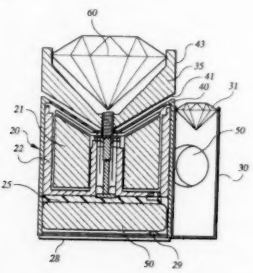
ROTATING DESIGN ELEMENT FOR A JEWELRY ITEM

Joseph C. Koll, 3901 Wanda Lynn Dr., Metairie, La. 70002

Continuation-in-part of application No. 09/173,083, filed on Oct. 14, 1998, now abandoned. This application Nov. 12, 1999, Appl. No. 440,009.

Int. Cl. A44C *17/02*

U.S. Cl. 63—31 **12 Claims**



1. A rotating design element assembly for a jewelry item comprising:

a casing attachable to a jewelry item;

a housing having an ornamental design element mounted thereto, said housing rotatably coupled with said casing;

a micro motor received within said casing for automatically rotating said housing relative to said casing to enhance the aesthetic effect of a jewelry item; said micro motor including a rotor shaft with a first end connected to said housing, said shaft having a substantially circular wing on an intermediate portion thereof, said wing having a plurality of magnets positioned thereon; said micro motor further including a stator encompassing said rotor shaft whereby the rotor is rotated by said stator when an electric current is applied thereto.

US 6,408,648 B1

METHOD FOR PRODUCTION OF METAL OXIDE GLASS MICROSPHERULES AT LOW TEMPERATURES

Toshinori Morizane, 26-k2, Hazawa 2-chome, Nerima-ku, Tokyo, Japan

Continuation of application No. 08/377,230, filed on Jan. 24, 1995, now abandoned, which is a division of application No. 08/202,252, filed on Feb. 25, 1994, now abandoned. This application Mar. 12, 1997, Appl. No. 815,682.

Int. Cl. C03B *37/016*

U.S. Cl. 65—17.2 **3 Claims**

1. A method for producing metal oxide micro-spherules, which comprises: subjecting a hydrolyzable organic metal compound to hydrolysis in a reaction solution consisting of water, an organic solvent, halogen ions as a catalyst and boron ions, while maintaining pH value of said reaction solution in a range of from 8 to 10, followed by dehydration and condensation to obtain micro-spherules; thereafter rinsing said micro-spherules with water for separation of said micro-spherules from the reaction solution; and maintaining said micro-spherules at a temperature of 200° C. or below.

US 6,408,649 B1

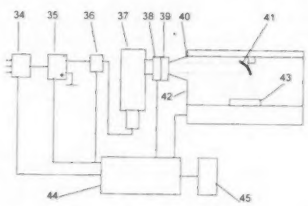
METHOD FOR THE RAPID THERMAL TREATMENT OF GLASS AND GLASS-LIKE MATERIALS USING MICROWAVE RADIATION

Vladislav E. Sklyarevich, and Mykhaylo Shevelev, both of Feasterville, Pa., assignors to Gyrotron Technology, Inc., Bristol, Pa.

Filed Apr. 28, 2000, Appl. No. 561,451

Int. Cl. C03B *23/00;29/00*

U.S. Cl. 65—102 **46 Claims**



1. A method of thermally treating at least one glass sheet for shaping, comprising placing the glass sheet having a temperature of up to the softening point of the glass sheet on a fixture and exposing the glass sheet to microwave radiation with uniformity ψ wherein ψ is greater than or equal to $100\%\{1—MoR/(Ks\Delta T)\}$ where the temperature dependent MoR and Ks are selected at their minimum and maximum value respectively, said microwave radiation having an effective frequency and a sufficient power density to heat at least one selected area of the glass sheet from any initial temperature up to the softening point of the glass sheet to any required temperature in a selected time whereby a sufficient tem-

perature distribution to allow shaping of the glass sheet is obtained in the selected area so that the glass sheet's internal thermal stress is prevented from exceeding its modulus of rupture.

US 6,408,650 B1

NITRATE/NITRITE-FREE MANUFACTURING OF GLASS WITH SELENIUM

Edward Nashed Boulos, Troy, Mich., and James Victor Jones, Toledo, Ohio, assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Dec. 10, 1997, Appl. No. 988,481

Int. Cl. C03B *5/16*

U.S. Cl. 65—134.3 **24 Claims**

1. A nitrate/nitrite-free method for retarding the volatilization of selenium used as a colorant in preparing a glass composition by including a manganese compound colorant along with the selenium without nitrate or nitrite compounds during the melt processing of the glass composition, the manganese compound being included to provide 0.1 to 1.0 wt. % manganese oxide as MnO_2 weight percent based on the total weight of the glass composition.

US 6,408,651 B1

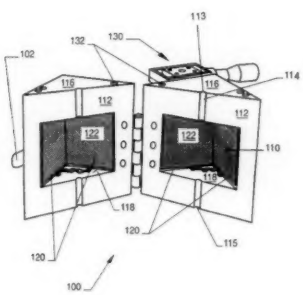
METHOD OF MANUFACTURING OPTICAL FIBERS USING THERMOPILES TO MEASURE FIBER ENERGY

James P. Terrell, Jr., Ithaca, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Provisional application No. 60/174,009, filed on Dec. 30, 1999. This application Jan. 21, 2000, Appl. No. 489,557.

Int. Cl. C03B *37/07*

U.S. Cl. 65—377 **9 Claims**



1. A method of measuring the temperature T_f of an optical waveguide fiber being drawn from a heated optical waveguide preform in a draw furnace, said method comprising the steps of:

passing said optical waveguide fiber through a chamber, said chamber being positioned downstream from said draw furnace;

maintaining a reference surface temperature T_r of one surface of each of a plurality of differential thermopiles, each of said differential thermopiles being fixed to an inner surface of said chamber; and

generating an aggregate output signal representative of the radiant energy absorbed by said differential thermopiles within said chamber.

US 6,408,652 B1

SOLUTION DOPING METHOD OF MAKING AN OPTICAL AMPLIFYING FIBER

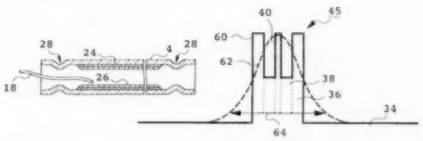
Koji Okamura, and Keiko Takeda, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of application No. 08/868,397, filed on Jun. 3, 1997. This application Apr. 27, 1999, Appl. No. 299,666.

Claims priority, application Japan, Dec. 27, 1996, 8-350156

Int. Cl. C03B *37/027*

U.S. Cl. 65—390 **7 Claims**



1. A process of producing an optical amplifying fiber, comprising the steps of in the following order:

(a) forming a first core layer mainly made of SiO_2 doped with GeO_2 or TiO_2 on an inner surface of a quartz reaction tube by chemical vapor deposition, said first core layer having a first refractive index;

(b) forming a soot-like second core layer mainly made of SiO_2 on said first core layer by chemical vapor deposition;

(c) impregnating said second core layer with a solution containing a solvent, a rare earth element and at least one element selected from the group consisting of Al, Zn, Sn and La;

(d) evaporating the solvent in the solution impregnated in said second core layer;

(e) heating said second core layer to vitrify said second core layer, said second core layer having a second refractive index lower than the first refractive index;

(f) forming a third core layer mainly made of SiO_2 doped with GeO_2 or TiO_2 on said second core layer by chemical vapor deposition, said third core layer having a third refractive index greater than the second refractive index;

(g) substantially uniformly collapsing said quartz reaction tube by heating to form a preform; and

(h) melting and spinning said preform to thereby produce an optical amplifying fiber having first, second and third cores having compositions and refractive indexes corresponding respectively to those of said first, second and third core layers such that the refractive index of the second core is lower than the refractive index of the first core and the refractive index of the third core is greater than the refractive index of the second core, said third core having an outer diameter of 1 μm or less and being the inner most core of said fiber, the concentration of said at least one element in said second core being 4 wt % or more.

US 6,408,653 B1

APPARATUS AND METHOD FOR MANUFACTURING OPTICAL FIBER PREFORM BY MCVD

Sung-koog Oh; Man-seok Seo; Mun-hyun Do, and Jin-seong Yang, all of Gumi, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 25, 1999, Appl. No. 344,365

Claims priority, application Rep. of Korea, Jun. 25, 1998, 98-24158

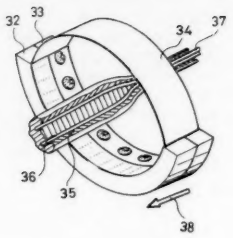
Int. Cl. C03B *37/018*

U.S. Cl. 65—419 **7 Claims**

1. A heating apparatus for manufacturing an optical fiber preform, comprising:

a spread flame burner for heating a substrate tube by a low pressure flame for deposition of soot on the substrate tube and for softening the substrate tube prior to collapsing the substrate tube to form the optical fiber preform;

a concentrated flame burner positioned adjacent to the spread flame burner for heating the substrate tube by a high pressure



flame relative to the low pressure flame of the spread flame burner, for collapsing the substrate tube to form the optical fiber preform; and

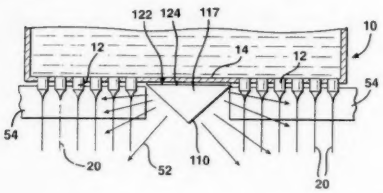
a reflector for reflecting heat from the spread flame burner and from the concentrated flame burner toward the substrate tube, a surface of the reflector facing the substrate tube including a mirror polish.

US 6,408,654 B1

FILAMENT FORMING APPARATUS AND A COOLING APPARATUS FOR AND METHOD OF INDUCING A UNIFORM AIR FLOW BETWEEN A FILAMENT FORMING AREA AND THE COOLING APPARATUS

Douglas Scott Boessneck, Westerville; Guang Gao; David Herman Wolf, both of Newark; Andrew Lawrence Snedden, Mt. Perry; Patrick John Prescott, Newark; Seshadri Srinivasan, Worthington, and Jeffrey Coon, Newark, all of Ohio, assignors to Owens Corning Fiberglas Technology, Inc., Summit, Ill.

Filed Jun. 9, 1999, Appl. No. 329,144
Int. Cl. C03B *37/02*
U.S. Cl. 65—434 **12 Claims**



7. A method of cooling a glass filament forming area beneath a bushing in a filament forming apparatus, the bushing having two laterally spaced apart banks of tips from which filaments are attenuated, the method comprising the steps of:

disposing adjacent the filament forming area an air housing having top walls and first and second side walls defining therebetween an air chamber, said air housing positioned between the banks of tips, said first side wall including an opening, said opening facing the filament forming area beneath a first bank of tips; and

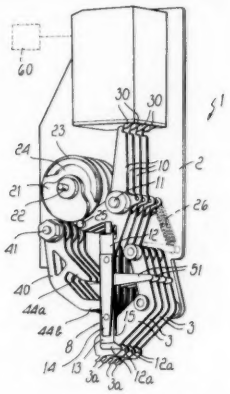
inducing a first flow of air between the filament forming area beneath said first bank of tips and said a chamber to cool the filament forming area beneath said first bank of tips, said first flow of air having sufficient velocity to force air between the banks of tips into the filament forming area beneath said first bank of tips.

US 6,408,655 B1

DEVICE FOR SELECTIVELY FEEDING THREADS IN KNITTING MACHINES OR THE LIKE

Severino Ossensi, Viggiu', and Dionigi Fantini, Ghirla, both of Italy, assignors to Mec-Mor S.r.l., Induno Olona, Italy

PCT No. PCT/EP00/04456, § 371 Date Nov. 5, 2001, § 102(e) Date Nov. 5, 2001, PCT Pub. No. WO00/73564, PCT Pub. Date Dec. 7, 2000
PCT Filed May 17, 2000, Appl. No. 959,685
Claims priority, application Italy, May 26, 1999, MI99A1168
Int. Cl. D04B *27/10*
U.S. Cl. 66—140 R **12 Claims**



1. A device for selectively feeding threads in knitting machines, comprising: a set of fixed stripers arranged side by side and provided on an outer side of needle bed or beds of the machine, each one of said stripers having a passage for a thread to be fed to needles of the machine; an element for clamping and cutting, with a linear motion, the thread arriving from the corresponding striper being provided for each one of said stripers; wherein said clamping and cutting element is movable from a standby position, in which it is laterally adjacent to the corresponding striper on the outer side of the needle bed of the machine and clamps the thread arriving from the corresponding striper, to an active position, in which at least a region thereof that engages the thread is arranged on an inner side of the needle bed of the machine in order to arrange the thread transversely to the needle bed of the machine and then release the thread, and vice versa, in order to clamp and cut the thread arriving from the corresponding striper; and wherein the device further comprises first actuation means which act on said clamping and cutting element in order to move it from said standby position to said active position and vice versa; said first actuation means comprising a programmable electronic controller for individual actuation, according to a preset program, of each clamping and cutting element for transfer thereof from the standby position to the active position and vice versa.

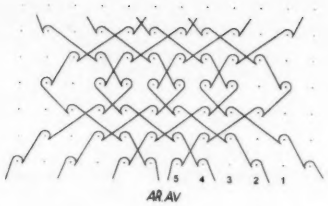
US 6,408,656 B1

ISOELASTIC PROSTHETIC FILET STITCH FABRIC

François Régis Ory, Fontaines Saint Martin; Michel Therin, Lyons, and Alfredo Meneghin, Villefranche sur Saone, all of France, assignors to Sofradim Production, Trevoux, France

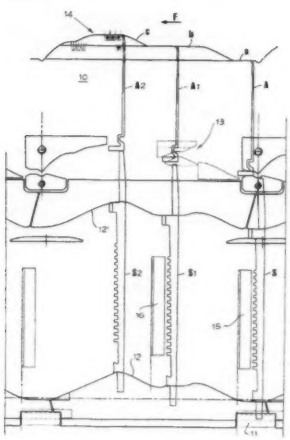
PCT No. PCT/FR99/01512, § 371 Date Feb. 28, 2001, § 102(e) Date Feb. 28, 2001, PCT Pub. No. WO99/66860, PCT Pub. Date Dec. 29, 1999
PCT Filed Jun. 23, 1999, Appl. No. 719,996
Int. Cl. D04B *21/00*
U.S. Cl. 66—195 **14 Claims**

1. An isoelastic prosthetic open knit based on a monofilament of a biocompatible polymer material, whose pattern is defined by a front lap and a rear lap of yarns knitted together and determines a



plurality of cells each having a substantially polygonal shape, characterized in that said pattern gives the knit a multidirectional tensile behavior obtained by a front lap capable of being obtained by knitting according to a scheme 5-4/4-3/2-1/0-1/1-2/3-4 and by a rear lap capable of being obtained by knitting according to a scheme 0-1/1 -2/3-4/5-4/4-3/2-1.

US 6,408,657 B2
METHOD FOR SELECTING THE NEEDLES IN CIRCULAR STOCKING KNITTING MACHINES AND KNITTING MACHINES, AND MACHINE FOR CARRYING OUT THE METHOD
Fulvio Sangiacomo, Brescia, Italy, assignor to Sangiacomo S.p.A., Italy
Filed Feb. 15, 2001, Appl. No. 783,882
Claims priority, application Italy, Feb. 29, 2000, BS00A0015
Int. Cl. D04B *9/00*
U.S. Cl. 66—216 **7 Claims**



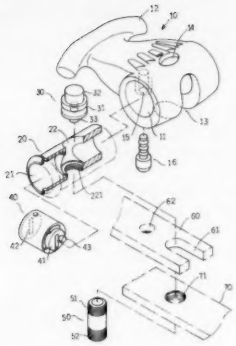
1. A circular knitting machine, comprising:
a plurality of needles forming a cylinder;
jacks; and
a feed station having a feed station needle selection region, the feed station including
an extraction element for extracting all jacks at a beginning of said needle selection region to place all jacks in a position for selection,
a first selection unit disposed at a location of said needle selection region beyond said extraction element with respect to a feed direction of said feed station, said first selection unit for canceling jacks or selecting jacks to carry needles to a needle position for making a held stitch, and
a second selection unit disposed at a location of said needle selection region beyond said first selection unit with respect to the feed direction of said feed station, said second selection unit canceling jacks to maintain the needle position for making a held stitch and for selecting jacks to carry needles to a needle position for making a dropped stitch.

US 6,408,658 B1
HINGED SOLID STEEL JAWED WHEEL LOCK, W/ADJUSTABLE PAD-LOCKABLE HARDENED CHAIN CLOSER
Steven Bertus Pickett, 116 Emmons Hill Rd., Oneonta, N.Y. 13820, assignor to Steven Bertus Pickett, Oneonta, N.Y.
Filed Aug. 31, 1999, Appl. No. 388,061
Int. Cl. E05B *73/00*
U.S. Cl. 70—14 **1 Claim**

1. A trailer wheel rim lock device for impeding movement of a trailer, comprising:
a stationary hardened solid round L-shaped steel jaw member having one end formed as a tip with a rubber end cap thereon and an opposite end affixed to top and bottom hinge plates;
a movable hardened solid round L-shaped steel jaw member having one end formed as a tip with a rubber end cap thereon and an opposite end having an aperture, said opposite end being received between the top and bottom hinge plates adjacent the stationary jaw member, and said aperture being aligned with an aperture in the top and bottom hinge plates to receive a hardened hinge pin;
a hardened steel chain having a first end and a second end;
a chain anchor block affixed to the stationary jaw member by a swaged pin at a position adjacent the hinge plates and having the first end of the chain affixed thereto;
a chain guide member affixed to the movable jaw member at a position adjacent the hinge plates to receive the chain therethrough; and
a padlock; and
wherein the jaws are placed around opposing sides of a wheel rim and the chain is passed through the guide member and tightened until the movable jaw is tightened toward the stationary jaw and the jaws are securely around the wheel rim, the second end of the chain is then padlocked to a link at an intermediate point of the chain to secure and lock the device to the wheel rim.

US 6,408,659 B1
QUICK LOCK
Chin-Shu Chang, Chang Hua, Taiwan, assignor to Handyway Co., Ltd., Chang Hua, Taiwan
Filed Dec. 6, 2000, Appl. No. 729,726
Int. Cl. B62H *5/06*
U.S. Cl. 70—19 **1 Claim**

1. A lock for fastening/unfastening a first work piece having a slot on one end and a through hole adjacent the slot and a second work piece having a threaded hole comprising:
a lock shell including an axial through hole, a radial through hole in communication with the axial through hole, and a threaded section on an inner surface of a lower portion of the radial through hole;



a handle mechanism including a recess in a lower portion thereof for pivotably receiving the lock shell, a handle on a top portion of the handle mechanism, an arcuate groove in a bottom portion of the handle mechanism in communication with the recess, a hole on one side in communication with the radial through hole and the recess, an aperture on the other side, and a pin fixed in the aperture;

an adjusting bar slidingly disposed in the radial through hole, the adjusting bar including an upper end, a lower end, and an annular groove between the upper and the lower ends;

a lock body secured in the axial through hole, the lock body including a keyhole on one end, a rotatable lock mechanism on the other end, and a rotatable stud on the lock mechanism capable of being activated to move into or retract from the annular groove; and

a cylinder including an upper threaded section threadedly secured to the threaded section of the lock shell, a spaced lower threaded section passed through the slot to be threadedly secured to the threaded hole of the second work piece, and a top hole for receiving the lower end of the adjusting bar,

wherein in fastening the work pieces together, the lock mechanism and the stud are rotated by turning the keyhole for causing the stud to move into engagement with the annular groove of the adjusting bar for lowering the adjusting bar, the upper end of the adjusting bar is moved into the radial through hole of the lock shell for permitting the handle mechanism to pivot about the lock shell in a first direction until the pin is moved into the through hole of the first work piece, the stud is rotated to hoist the adjusting bar until the upper end of the adjusting bar is passed through the radial through hole of the lock shell to be in the hole of the handle mechanism, the stud is rotated to lower the adjusting bar until the upper end of the adjusting bar is cleared from the hole of the handle mechanism to be in the radial through hole of the lock shell; and in unfastening the work pieces, pivot the handle mechanism about the lock shell in a second direction opposite to the first direction until the pin is cleared from the through hole of the first work piece and disengage the cylinder from the slot of the first work piece.

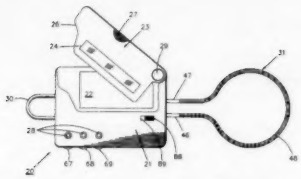
US 6,408,660 B1

COMBINED LUGGAGE TAG AND LOCKING SYSTEM

Eric Lai, Sheung Shui, The Hong Kong Special Administrative Region of the People's Republic of China, assignor to The Sun Lock Company LTD, Tuen Mun, The Hong Kong Special Administrative Region of the People's Republic of China

Filed Dec. 29, 2000, Appl. No. 752,363
Int. Cl. E05B *37/06*
U.S. Cl. 70—30 **15 Claims**

1. A combination luggage tag and locking system constructed to provide user identification and secure, locked engagement of any desired product, said system comprising



A. a housing comprising an outer surface on which an enlarged indicia receiving and displaying zone is formed;

B. a plate member pivotally mounted to the housing and movable between a first position in overlying protective relationship with the indicia receiving/displaying zone and a second position wherein said plate member is arcuately pivoted relative to the housing to provide access to the indicia receiving/displaying zone;

C. a shackle mounted to the housing and movable between a first locked position and a second unlocked position, said shackle comprising a generally J-shape incorporating

a. a short length having a terminating end constructed for cooperative locking and unlocking interengagement with the housing, and

b. a long leg having a terminating end portion journaled in a slider block for enabling rotational movement of the long leg about a central axis while preventing axial removal of the long leg from the slider block;

D. an elongated, substantially continuous cable member constructed for cooperating locking engagement with the housing and disengagement from the housing;

E. a plurality of dials each of said dials being rotationally mounted to the housing for ease of access and rotational movement relative to the housing;

F. a plurality of clutch rings each being rotationally mounted to the housing in overlying engagement with one of said dials and constructed for rotational movement with the rotational movement of the associated dial during the normal operation, and comprising a slot constructed for cooperative engagement with a locking finger; and

G. a locking plate mounted in the housing and movable between a first position cooperatively associative with the slider block of the shackle and the elongated flexible cable member to maintain the shackle and the cable member in secure, locked interengagement with the housing and a second position wherein the shackle and the cable member are unlocked and removable from the housing, said second position only being attainable by positioning the slots of each clutch ring in a precisely required orientation;

whereby a combination luggage tag and locking system is attained which is capable of enabling the user to provide identifying indicia on the surface thereof while also being able to securely lock a wide variety of products using either the shackle or the cable member.

US 6,408,661 B1

PADLOCK ASSEMBLY WITH A TWO-PART U-SHAPED LOCK CASING

Waterson Chen, 8F, No. 428, Wu-Chuan-Nan Rd., Taichung City, Taiwan

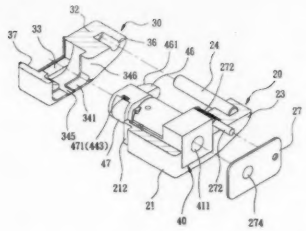
Filed Sep. 14, 1999, Appl. No. 395,521
Int. Cl. B60R *25/00*
U.S. Cl. 70—33 **13 Claims**

1. A padlock assembly comprising:

(a) a first lock casing part having

a hollow lock core mounting portion with front and rear end surfaces that are spaced apart from each other in a longitudinal direction, said lock core mounting portion being formed with a core receiving space that extends in the longitudinal direction through said front and rear end surfaces, and

a first shackle mounting portion that extends in a first transverse direction relative to the longitudinal direction from one side of said lock core mounting portion;



(b) a key-operated lock mechanism including

a cylindrical lock core formed with a key hole and disposed in said core receiving space, said lock core being adapted to be rotated inside said core receiving space upon insertion of a corresponding key into said key hole, said lock core having one end adjacent to said rear end surface of said lock core mounting portion, and

a latch member connected to said one end of said lock core and disposed outwardly of said core receiving space;

(c) a second lock casing part having

a latch engaging portion with front and rear ends, said latch engaging portion being formed with a latch recess that extends from said front end toward said rear end, and a latch retainer disposed inside said latch recess to partition said latch recess into a latch entrance portion proximate to said front end of said latch engaging portion, and a latch retention portion proximate to said rear end of said latch engaging portion, said latch member being extendible into said latch retention portion through said latch entrance portion and being rotatable inside said latch retention portion between locking and unlocking positions, said latch retainer engaging said latch member when said latch member is disposed in said latch retention portion to prevent removal of said latch member from said latch retention portion in a direction away from said rear end of said latch engaging portion, and

a second shackle mounting portion that extends in a second transverse direction parallel to the first transverse direction from one side of said latch engaging portion; and

(d) a shackle bar extending between said first and second shackle mounting portions, said shackle bar having opposite first and second ends, at least one of which is connected removably to a respective one of said first and second shackle mounting portions; and

said latch member including

a latch base coupled to said one end of said lock core and formed with a slide passage that extends in a third transverse direction relative to the longitudinal direction; and

a spring-loaded latch body mounted on said latch base inside said slide passage, said latch body being biased to extend outwardly of said slide passage so as to project in the third transverse direction relative to said lock core mounting portion.

US 6,408,662 B1

LOCKING DEVICE WITH KEY-OPERATED LOCK

Naoyuki Sugimoto, Tokyo, Japan, assignor to Takigen MFG. Co., Ltd., Tokyo, Japan

Filed Jul. 21, 2000, Appl. No. 620,851

Claims priority, application Japan, Aug. 2, 1999, 11-218462

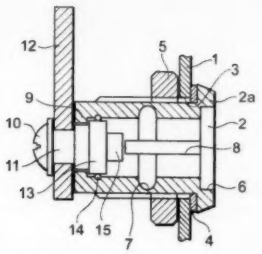
Int. Cl. E05B *29/04;27/02*

U.S. Cl. 70—375 **8 Claims**

1. A locking device with a key-operated lock comprising:

a cylindrical member having a front open end and a rear end,

locking means rotatably supported on said rear end of said cylindrical member, said locking means having a locking bar and a rotatable engagement member connected with respect to said locking bar, said engagement member being rotatable to turn said locking bar into a locking or an unlocking position,



a key-operated disk tumbler lock,

a cap cylinder casing said disk tumbler lock therein, said cap cylinder with said disk tumbler lock being detachably accommodated in said cylindrical member through the front open end, and

a locking operation member provided independent from said cap cylinder for engaging with and rotating said engagement member to turn said locking bar into locking or unlocking position,

wherein said cylindrical member has an engagement recess on its inner surface, said cap cylinder has a peripheral surface, and said disk tumbler lock has a lock pin capable of protruding through said peripheral surface and fitting in said engagement recess when said disk tumbler lock is set.

US 6,408,663 B1

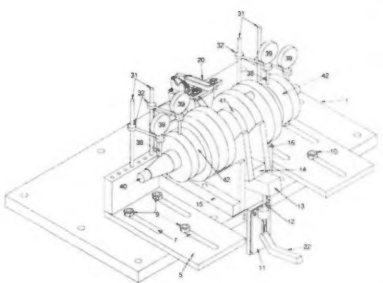
METHOD AND APPARATUS FOR TRUING CRANKSHAFTS

Gregory Bernard Pickren, Clearwater, Fla., assignor to Short Block Technologies, Inc., Clearwater, Fla.

Filed Feb. 23, 2001, Appl. No. 790,701

Int. Cl. B21C *51/00*

U.S. Cl. 72—31.03 **20 Claims**



1. An apparatus for truing a crankshaft, said apparatus comprising:

(a) a supporting base;

(b) a set of lockable holding means, attachable to said supporting base, comprising at least one movable support block and two stationary support blocks, flanking said movable support block and laterally adjustable with respect to each other, each such support block shaped as to allow the blocks to receive and hold said crankshaft;

(c) a movable shelf, attachable to said movable support block, provided with means for causing it to hinge with respect to the surface of said supporting base;

(d) lever means, attachable to said supporting base, for raising and lowering said movable shelf;

(e) a plurality of position detection means mounted on holders, attachable to said supporting base and capable of sliding across said supporting base and moving and retrieving said position detection means over said crankshaft; and

(f) clamping means, attachable to said apparatus, for compressing and holding in place said crankshaft to be trued.

US 6,408,664 B1

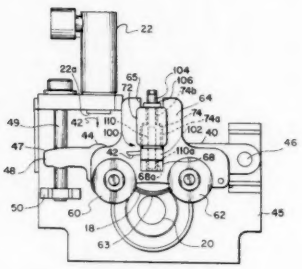
HYDRAULIC POSITIONING ASSEMBLY FOR COLD ROLLING TUBES

James O. Williams, Marlborough, Mass., assignor to Anvil International, Decatur, Ill.

Provisional application No. 60/146,848, filed on Aug. 3, 1999, Provisional application No. 60/146,849, filed on Aug. 3, 1999. This application Aug. 2, 2000, Appl. No. 630,496.

Int. Cl. B21D *15/04*

U.S. Cl. 72—105 **9 Claims**



8. A cold rolling apparatus, comprising:

an outside roll which applies a forming load to a tube when cold rolling the tube,

a hydraulic positioning assembly including a face plate mounted for movement with the outside roll and positioning rollers mounted to the face plate, the positioning rollers being disposable for initial contact with a tube surface and arranged to apply a positioning load to the tube, the hydraulic positioning assembly further including a cylinder body coupled to the outside roll and housing a piston, the face plate being coupled to the piston for movement with the piston relative to the outside roll, and

a hydraulic circuit coupled to the outside roll for applying the forming load to the tube, the hydraulic positioning assembly being coupled to the hydraulic circuit such that the positioning load is directly related to the forming load.

US 6,408,665 B1

FINISH HOT ROLLING METHOD FOR STRUCTURAL STEELS

Junji Nishino; Koichi Hasegawa, and Akira Terashima, all of Muroran, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

PCT No. PCT/JP00/05341, § 371 Date Jan. 8, 2001, § 102(e) Date Jan. 8, 2001, PCT Pub. No. WO01/10578, PCT Pub. Date Feb. 15, 2001

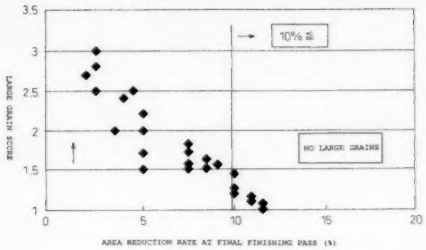
PCT Filed Aug. 9, 2000, Appl. No. 743,307

Claims priority, application Japan, Aug. 9, 1999, 11-225708

Int. Cl. B21B *13/12*

U.S. Cl. 72—235 **5 Claims**

1. A finish hot rolling method for structural steels using a 2-stand 3-roll finishing mill characterized by setting the area reduction rate of the final finishing pass to 10 to 20% and the value of an area reduction rate of the final finishing pass divided by the corresponding area reduction rate of the pass preceding the final finishing pass to 0.7 to 1.3.



US 6,408,666 B1

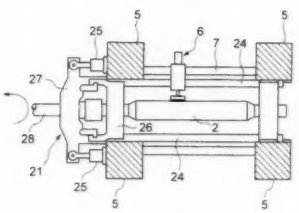
ROLLING MILL AND ROLLING METHOD

Kenjiro Narita, Hitachinaka; Mitsuo Nihei, Hitachi; Takehiko Saito, Hitachi; Toshiyasu Shinmura, Hitachi; Shinichi Kaga, Hitachi, and Takashi Kamoshita, Hitachinaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 11, 2000, Appl. No. 659,080

Int. Cl. B21B *27/06*

U.S. Cl. 72—236 **6 Claims**



1. A rolling mill comprising at least one pair of upper and lower working rolls each movable in a direction of axis of each of said rolls, at least one of profile-measuring means for measuring a profile of said working rolls and profile-estimating means for estimating said profile of said working rolls, said profile of said working rolls being a sum of a thermal expansion profile of said working rolls and a wear profile of said working rolls, grinding means for grinding a surface of said working rolls, and grinding-instructing means for instructing the grinding means to perform grinding of the working rolls so that at least one of measured profile of the working rolls and estimated profile of said working rolls is in a level lower in value than said thermal expansion profile of the working rolls.

US 6,408,667 B1

FOUR-HIGH MILL STAND ROLL CHANGE DEVICE, A METHOD OF RETROFIT, AND A ROLL CHANGE DEVICE THEREFROM

Jose M. de Jesus, Jr., Abington, Md., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

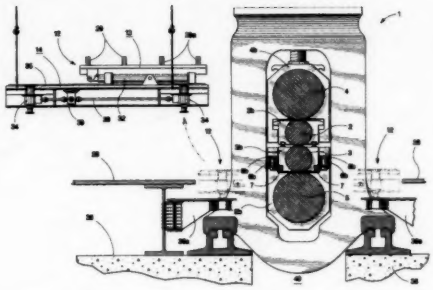
Filed Oct. 26, 2000, Appl. No. 696,835

Int. Cl. B21B *31/07*

U.S. Cl. 72—238 **19 Claims**

1. A roll change apparatus for changing a work roll assembly that includes a work roll mounted in work roll chocks moveably contained within pockets in backup roll chocks that support a backup roll within a four-high rolling mill stand, comprising:

a) actuators fastened to opposed inboard facing surfaces of the backup roll chocks that support the backup roll in the four-high rolling mill stand;



b) parallel spaced apart lift-rails attached to said actuators such that one end of each said lift-rail extends to a position below one of the work roll chocks and such that an opposite end of each said lift-rail extends to a position below the other work roll chock, each said extended lift-rail portion engaging a surface of the work roll chocks and lifting said work roll assembly to a roll changing position located above the backup roll when said actuators are operated to move said lift-rails in an upward direction, and each said extended lift-rail portion disengaging from said surface of the work roll chocks when the work roll contacts the lower backup roll in response to said actuators operated in a downward direction.

US 6,408,668 B1

BACK-UP OR INTERMEDIATE ROLLER FOR PRODUCING A FLAT ROLLED PRODUCT IN A ROLLING MILL

Dieter Figge, Essen; Wilhelm Schwerdt, Alpen, and Uwe Quitmann, Willich, all of Germany, assignors to SMS Demag AG, Düsseldorf, Germany

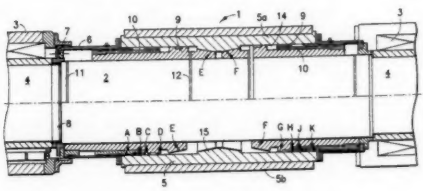
PCT No. PCT/DE99/02176, § 371 Date Feb. 16, 2001, § 102(e) Date Feb. 16, 2001, PCT Pub. No. WO00/06315, PCT Pub. Date Feb. 10, 2000

PCT Filed Jul. 12, 1999, Appl. No. 744,339

Claims priority, application Germany, Jul. 24, 1998, 198 35 089

Int. Cl. B21B *29/00*

U.S. Cl. 72—241.4 **8 Claims**



1. A supporting or intermediate roll in a rolling mill for rolling flat rolling stock, comprising: a cylindrical roll core; a tubular roll sleeve connected in a rotationally fixed manner to the roll core so as to engage coaxially around the roll core; and hydraulically axially displaceable supporting bodies arranged between the roll sleeve and the roll core so as to support the roll sleeve against the roll core, the supporting bodies being formed with at least two annular pistons which are arranged symmetrically in relation to a center of the roll and are sealed in relation to the roll core on an inside of the roll sleeve, the annular pistons have a plurality of annular supporting bearings which are arranged on an outer circumference of said pistons, are spaced apart from one another in a longitudinal direction of the roll and against which an inner surface of the roll sleeve can be positioned, the annular pistons being telescopic pistons that bear further annular pistons which can be controlled independently and on which further spaced-apart annular supporting bearings are formed so that it is possible to change spacings of the supporting bearings in relation to the support bearings arranged on other annular pistons and positions of said supporting bearings in relation to the longitudinal extent of the roll, by displacement of the annular pistons.

US 6,408,669 B1

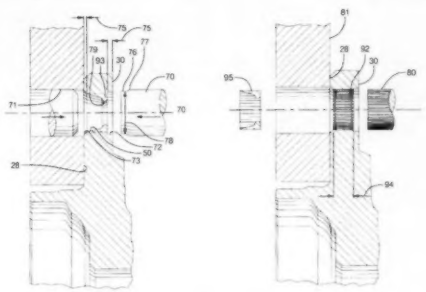
METHOD AND APPARATUS FOR WHEEL SPINDLES AND THE LIKE WITH IMPROVED LRO

Steven Eugene Meeker, Norwalk; Richard Allen Scheufler, Jr., Collins; Christopher J. Zuck, and John R. Beverick, both of Sandusky, all of Ohio, assignors to Delphi Technologies, Inc., Troy, Mich.

Filed Nov. 15, 2000, Appl. No. 713,681

Int. Cl. B21D *28/32;53/26*

U.S. Cl. 72—325 **10 Claims**



1. A method for forming an opening in a steel flange into which is pressed a serrated shaft comprising the acts of:

a) providing a blanking die having an opening on one side of the flange and a punch having a diameter smaller than the blanking die opening at the opposite side of the flange;

b) forcing the punch through the flange to produce an axially extending frusto-conical opening having a minor diameter equal to the punch diameter at the opposite flange side and a major diameter equal to the blanking die opening at the one flange side;

c) providing a coining punch of diameter greater than the shaft major diameter;

d) forcing the coining punch into each end of the frusto-conical opening a set axial distance sufficient to extrude at least in the frusto-conical opening adjacent the minor diameter a work-hardened upset metal mass while providing countersunk openings at the axial ends of the frusto-conical opening;

e) providing a cylindrical serration punch; and,

f) forcing the serration punch through the frusto-conical opening from the opposite side to produce a cylindrical hole between the countersunk openings while shearing the work-hardened upset metal mass from the frusto-conical opening and forming radially outward extending serrations which extend for some axial distance in flange metal that is in a substantially non-work hardened state.

US 6,408,670 B1

CARRIERLESS PROGRESSIVE DIE SYSTEM

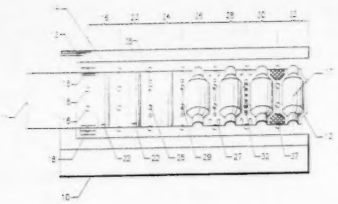
George Trapp, 42993 Ashbury Dr., Novi, Mich. 48375

Provisional application No. 60/150,648, filed on Aug. 25, 1999. This application Aug. 25, 2000, Appl. No. 648,931.

Int. Cl. B21D *28/06*

U.S. Cl. 72—328 **21 Claims**

1. A carrierless progressive die apparatus for improving quality and reducing material costs, said carrierless progressive die apparatus comprising: a plurality of die stations for performing operations on a strip of material having a width which is substantially



the same as a width of a finished part made in said die apparatus, a substantially continuous die lifter and stripper pad combination extending from a first to a last of said plurality of die stations, said die lifter and stripper pad combination forming a flat continuous surface for transporting said strip of material through said plurality of stations; a means attached to said die lifter and stripper pad combination for guiding said strip of material through said progressive die apparatus; and a means for feeding said strip of material through said plurality of stations.

US 6,408,671 B1

HYDROMECHANICAL DRIVE OF A CROSS-SHEARING STATION

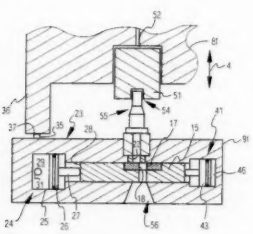
Richard Knödler, Schwäbisch Gmünd, Germany, assignor to Schuler Pressen GmbH & Co. KG, Goppingen, Germany

Filed Oct. 6, 2000, Appl. No. 679,520

Claims priority, application Germany, Oct. 6, 1999, 199 48 002

Int. Cl. B21D *28/00*

U.S. Cl. 72—332 **11 Claims**



1. A press for operations which include massive forming, comprising:

a press frame with which a slide is movably disposed and is operatively connected with a driving device,

a workpiece receiving space in which a tool having at least two tool parts is operatively arranged for deforming a workpiece in said press has been inserted after arranged;

a forming device for which at least one forming element is movably arranged in one of the tool parts; and

a driven hydraulic, valveless force transmitting device operatively connected with the forming element to control a working stroke of the for deforming a workpiece in said press.

US 6,408,672 B1

PROCESS FOR COLD FORMING TUBE ENDS

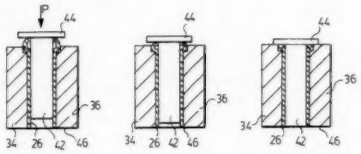
Derek Vernon Roe, Woodstock, and Ovidiu I. Savescu, Cambridge, both of Canada, assignors to Copperweld Canada Inc., Canada

Filed Feb. 24, 2000, Appl. No. 511,938

Claims priority, application Canada, Feb. 24, 1999, 2262777

Int. Cl. B21D *19/12*

U.S. Cl. 72—370.11 **5 Claims**



1. A process for reinforcing, an end of a metal tube having inner and outer surfaces and first and second ends, the process comprising the steps of:

a) providing a die having first and second ends and defining a cavity conforming to the outer surface of said tube, the cavity having a recess at said first end that is wider than the tube;

b) placing the tube in said die cavity such that said tube first end extends out of said die cavity and out of said recess beyond said die first end;

c) providing a means for preventing movement of the tube longitudinally with respect to said die cavity;

d) providing a mandrel having a first portion adapted to fit within said tube through said tube first end, the mandrel also having a second portion with a tube deforming surface adapted to impinge upon said tube first end;

e) inserting said mandrel first portion into the first end of said tube until the tube deforming surface contacts the first end of the tube;

f) advancing the mandrel under pressure thereby causing cold deformation of the first end of the tube and folding of same into the recess of said die cavity.

US 6,408,673 B1

ADJUSTING PLATE FOR A PRESS

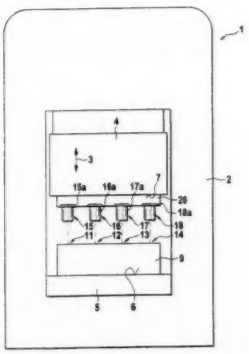
Ekkehard Körner, Göppingen, and Richard Knödler, Schwäbisch Gmünd, both of Germany, assignors to Schuler Pressen GmbH & Co. KG, Göppingen, Germany

Filed Sep. 5, 2000, Appl. No. 654,896

Claims priority, application Germany, Sep. 3, 1999, 199 41 925

Int. Cl. B21J *13/00*

U.S. Cl. 72—446 **10 Claims**



1. Adjusting plate for a transfer press for massive forming, comprising

a basic body which is set up for the detachable fastening to a press slide or a press bedplate,

a holding device which is set up for supporting a tool part and is arranged in or on the basic body,

adjusting devices which are assigned to the holding device,

a driving device is assigned to each adjusting device and includes a horizontally-disposed spindle gearing, and

a blocking device operatively associated with the spindle gearing as a non-positive direct connection for preventing undesired activation of the adjusting devices.

US 6,408,674 B1

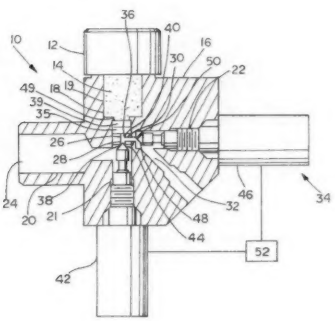
PRESSURE ACTIVATED CALIBRATION SYSTEM FOR CHEMICAL SENSORS

John Patrick Dilger, Marshalltown, Iowa, assignor to Fisher Controls International, Austin, Tex.

Filed Apr. 7, 1999, Appl. No. 287,245

Int. Cl. G01N *21/00*

U.S. Cl. 73—1.02 **7 Claims**



1. A leak sensor calibration device, comprising:

a reservoir for sotring a calibrant;

a conduit in flow communication with the reservoir, the conduit including a bore;

an insert sized for insertion into the bore, the insert defining a dosing chamber for storing a measured quantity of the calibrant, the dosing chamber defined exclusively by a T-shaped bore in the insert;

an outlest nozzle in flow communication with the dosing chamber;

an air supply source adapted to pressureized the measured quantity of calibrant stored in the dosing chamber; and

a valve mechanism adapted to eject the measured quantity of calibrant stored in the dosing chamber to the atmosphere through the outlet nozzle, wherein the valve mechanism includes a first valve disposed between the dosing chamber and the outlet nozzle, the first valve being shiftable between a closed position and an open position, the first valve in the further including a second valve disposed between the air supply source and the dosing chamber, the second valve being shiftable between a closed position and an open position, the second valve in the closed position isolating the air supply source from the dosing chamber.

US 6,408,675 B1

ECCENTRIC ERROR CORRECTOR AND METHOD OF ECCENTRIC ERROR CORRECTION FOR ACCELERATION SENSOR IN ACCELERATION GENERATING APPARATUS

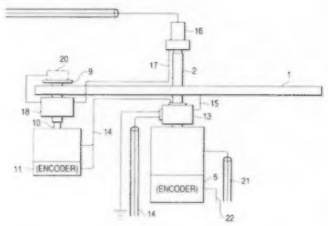
Takashi Kunimi, Saitama, Japan, assignor to Akebono Research & Development Centre Ltd., Saitama, and Akebono Brake Industry Co., Ltd., Tokyo, both of Japan

Filed Jan. 19, 2000, Appl. No. 487,224

Claims priority, application Japan, Jan. 19, 1999, 11-010253

Int. Cl. G01P *3/16*

U.S. Cl. 73—1.37 **3 Claims**



1. An eccentric error corrector for a rotary-type acceleration generating apparatus including a large-diameter turntable rotated by a first servo motor and a small-diameter turntable mounted on the outer periphery portion of the large-diameter turntable and rotatable by a second servo motor, in which an acceleration sensor is attachable to the small-diameter turntable, said eccentric error corrector comprising:

a DC-component remover removing only the DC component from an output signal of the acceleration sensor attached on the small-diameter turntable.

US 6,408,676 B1

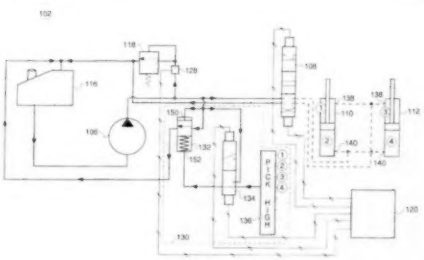
METHOD AND APPARATUS FOR DETERMINING THE STATUS OF A RELIEF VALVE

Kenneth L. Stratton, Dunlap; Steven R. Genseal; Steven R. Krause, both of Chillicothe; Patrick M. Pecchio, and Richard J. Skiba, both of Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Mar. 31, 1999, Appl. No. 282,381

Int. Cl. G01M *19/00*

U.S. Cl. 73—1.72 **20 Claims**



1. A method for determining a status of a relief valve located within a fluid system having a pump and an actuator valve, the fluid system being located on an earth moving machine, the pump delivering fluid to an actuator through the actuator valve, the system including a pressure compensation assembly adapted to control the fluid pressure of the system by bypassing fluid flow, and a pressure sensor, comprising the steps of:

positioning the actuator valve in a closed position;

deactivating the pressure compensation assembly; thereby deactivating the bypass flow; and

sensing a relief pressure of the system.

US 6,408,677 B1

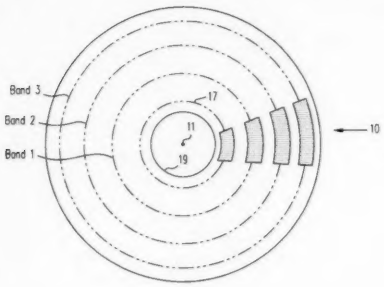
CALIBRATION DISK HAVING DISCRETE BANDS OF COMPOSITE ROUGHNESS

Shoji Suzuki, San Jose, Calif., assignor to Komag Corporation, San Jose, Calif.

Continuation-in-part of application No. 09/164,208, filed on Sep. 30, 1998, now Pat. No. 6,164,118. This application Aug. 7, 2000, Appl. No. 633,434.

Int. Cl. G01B *5/28*

U.S. Cl. 73—1.89 **42 Claims**



1. A calibration disk for calibrating a head, said calibration disk comprising:

a calibration area, wherein:

said calibration area is created by texturing said calibration disk;

said calibration area includes a plurality of circumferential bands extending substantially concentric to one another;

each of said circumferential bands has a corresponding composite roughness; and

wherein said corresponding composite roughness comprises a micro-waviness and a roughness.

US 6,408,678 B1

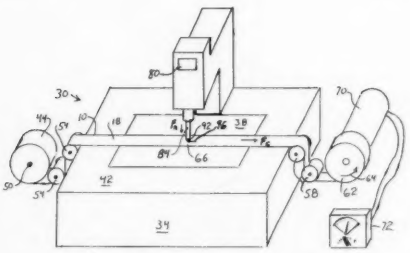
BURNISHING TAPE TESTING METHOD AND DEVICE

Manoj Chopra, Campbell; Charles H. Lee, San Jose, both of Calif.; Thorsten Lohmeyer, Woerrstadt, Germany; Jay Allan Merz, Aromas, and Hoa-Binh Tu, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 13, 2000, Appl. No. 687,673

Int. Cl. G01N *3/56*

U.S. Cl. 73—9 **8 Claims**



1. A method for testing burnishing tape comprising the steps of:

applying a normal force F_n to an abrasive material surface of said burnishing tape;

applying a pulling force to said burnishing tape;

determining a critical pulling force F_c at which said pulling force is sufficient to cause motion of said burnishing tape under the application of said normal force;

comparing said critical force F_c with a predetermined force D, whereby if said critical force F_c is less than said predetermined critical force D said tape is determined to be defective.

US 6,408,679 B1

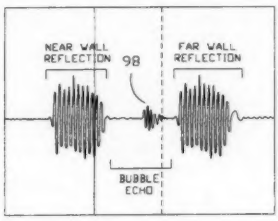
BUBBLE MEASURING INSTRUMENT AND METHOD

Robert Kline-Schoder, Norwich, Vt., and Patrick J. Magari, Plainfield, N.H., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 4, 2000, Appl. No. 498,440

Int. Cl. G01S *15/34;* **G01N** *29/02;* **A61B** *8/00*

U.S. Cl. 73—19.03 **26 Claims**



1. A method for monitoring a selected volume of liquid for bubbles, said method comprising:

producing a first acoustic signal at a first frequency, said first frequency being a resonance frequency of a selected diameter of said bubbles and operable for resonating said bubbles of said selected diameter;

producing a second acoustic signal having a second frequency higher than said first frequency, producing said second acoustic signal in pulses such that said pulses are produced at a repetition frequency;

choosing said first frequency and said repetition frequency to produce a beat signal with a selected frequency; and monitoring said beat signal at said selected frequency to detect said bubbles.

US 6,408,680 B2

SENSOR AND METHOD FOR THE MANUFACTURE

Karl-Hermann Friese; Heinz Geier, both of Leonberg; Helmut Weyl, Schwieberdingen, and Hans-Martin Wiedenmann, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE98/00008, § 371 Date Apr. 8, 1999, § 102(e) Date Apr. 8, 1999, PCT Pub. No. WO98/38505, PCT Pub. Date Sep. 3, 1998

PCT Filed Jan. 7, 1998, Appl. No. 171,717

Claims priority, application Germany, Feb. 25, 1997, 197 07 456

Int. Cl. G01N *27/12;* **H01C** *7/00;* **G01M** *19/00;* **H01L** *7/00;* **B05D** *5/12*

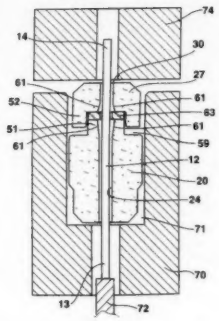
U.S. Cl. 73—23.31 **16 Claims**

1. A sensor for determining an oxygen content in an exhaust gas of an internal combustion engine, comprising:

a metal housing having a longitudinal bore;

a receptacle situated in the longitudinal bore of the metal housing and including a measured-gas-side ceramic shaped element and a connector-side ceramic shaped element, the measured gas-side ceramic shaped element having an extension that cooperates with a recess formed in the connector-side ceramic shaped element to form a cavity and a closeable radial gap;

a sensing element seal including a glass seal that is pressed while molten into the cavity; and



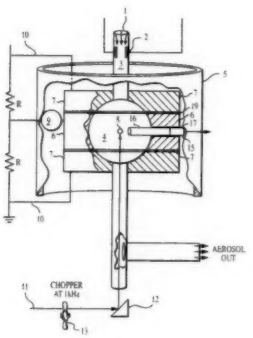
a sensing element situated in the receptacle in a gas-tight manner via the sensing element seal.

US 6,408,681 B1

SINGLE PARTICLE PHOTOACOUSTIC ABSORPTION SPECTROMETER

Kristan P. Gurton, Silver Spring, and James B. Gillespie, Ellicott City, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 23, 2000, Appl. No. 533,956
Int. Cl. G01N *21/00*
U.S. Cl. 73—24.02 **12 Claims**



1. A single particle photoacoustic absorption spectrometer comprising:

a particle trap for suspending a charged particle in free-space in a non-intrusive manner;

a source of a modulated electromagnetic energy directed at the charged particle for rapid heating and cooling of the particle at the modulation frequency, resulting in an acoustic signal that is directly proportional to amount of energy absorbed by the particle;

an acoustic transducer for detecting sound waves emitted by the suspended particle; and,

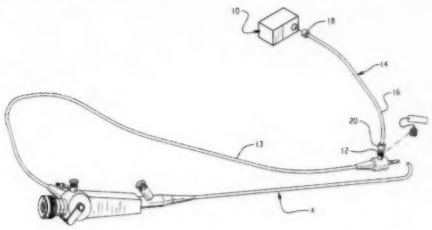
a tuned resonant cavity for amplifying the acoustic wave.

US 6,408,682 B2

LEAK DETECTION METHOD FOR ENDOSCOPES

Alan J. Greszler, Elyria, Ohio, assignor to Steris Inc., Temecula, Calif.

Continuation-in-part of application No. 09/498,870, filed on Feb. 7, 2000, Provisional application No. 60/193,648, filed on Mar. 31, 2000. This application Mar. 21, 2001, Appl. No. 813,869.
Int. Cl. A61L *2/00*; **B08B** *7/04*; **G01R** *31/12*; **G05D** *7/00*; **G01N** *27/00*
U.S. Cl. 73—40 **16 Claims**



13. A method of reprocessing endoscopes, the method comprising:

(a) positioning an endoscope in a reprocessing region;

(b) connecting a leak detector to the endoscope;

(c) supplying a quantity of compressed gas to an internal passage of the endoscope to pressurize the internal passage;

(d) electronically calculating whether the endoscope has leaks from changes in the temperature and pressure of the gas with time;

(e) releasing a portion but not all of the gas within the endoscope such that the pressure of the gas is above ambient pressure during step (f); and

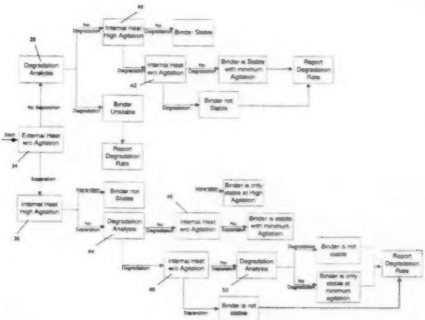
(f) in response to calculating that the endoscope does not have leaks, supplying an antimicrobial fluid to the reprocessing region to contact and decontaminate the endoscope.

US 6,408,683 B2

LABORATORY ASPHALT STABILITY TEST AND APPARATUS

Hussain U. Bahia, and Huachun Zhai, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Provisional application No. 60/089,217, filed on Jun. 15, 1998. This application Jun. 14, 1999, Appl. No. 332,626.
Int. Cl. G01N *11/00*; **C08L** *95/00*
U.S. Cl. 73—54.01 **31 Claims**



1. A method for testing asphalt for separation and degradation characteristics, wherein separation is characterized by division of the asphalt into its components and degradation is characterized by

the deterioration of asphalt components and/or any bonding therebetween, the method comprising:

(a) adding asphalt into a container allowing external heating of asphalt within the container, internal heating of asphalt within the container, and agitation of asphalt within the container;

(b) applying external heating to the asphalt within the container with no agitation;

(c) testing the asphalt of step (b) for separation;

(d) applying internal heating to the asphalt within the container with agitation;

(e) testing the asphalt of step (d) for degradation;

(f) if the asphalt of step (d) has degraded:

(i) applying internal heating to the asphalt within the container with no agitation, and

(ii) testing the asphalt of step (i) for separation and/or degradation.

US 6,408,684 B1

DETECTION DEVICE FOR APPARATUS FOR ANALYSIS

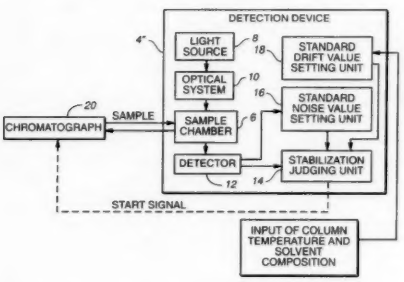
Hajime Bungo, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Jan. 21, 2000, Appl. No. 488,901

Claims priority, application Japan, Mar. 31, 1999, 11-090853

Int. Cl. G01N *31/08;30/86;* **G06F** *15/20;* **B01D** *15/08*

U.S. Cl. 73—61.61 **12 Claims**



1. A detection device for an apparatus for carrying out materials analysis, said detection device comprising:

a detector for outputting detection signals; and

a stabilization judging unit for measuring drift and noise of said detection signals over time and automatically transmitting a start signal which permits said apparatus to start said analysis when the measured drift becomes smaller than a standard drift value and the measured noise becomes smaller than a standard noise value.

US 6,408,685 B2

METHOD AND SYSTEM FOR MEASURING INTERFERENCE BETWEEN VALVE AND PISTON OF AN INTERNAL COMBUSTION ENGINE

Dalheun Shin, Seoul, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Division of application No. 08/950,492, filed on Oct. 15, 1997. This application May 4, 2001, Appl. No. 848,228.

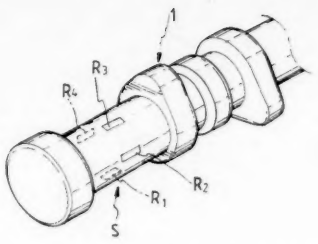
Claims priority, application Rep. of Korea, Oct. 15, 1996, 96-45888; Oct. 15, 1996, 96-45889

Int. Cl. G01L *3/26;5/13;* **G01M** *15/00*

U.S. Cl. 73—116 **9 Claims**

1. A method for measuring interference between a valve and a piston, comprising the steps of:

measuring a standard torque of a camshaft, related to camshaft distortion caused by engine RPM, through voltage detecting means;



measuring torsional distortion deviation of a crankshaft by fixing the camshaft and forcibly rotating the crankshaft by said standard torque value;

measuring vibration generated when the camshaft, the crankshaft, and the injection pump shaft are rotated, said measuring of vibration being performed using a torsional vibration meter and measuring a crankshaft rotational angle to detect a piston TDC position, both measurements being conducted at a predetermined level of engine RPM;

displaying piston and intake/exhaust valve movement on a graph at the piston TDC position after analyzing torsional distortion deviation and vibration of each of the camshaft and crankshaft; and

determining whether there is interference between the intake/exhaust valve and the piston by comparing design values with that displayed on the graph.

US 6,408,686 B1

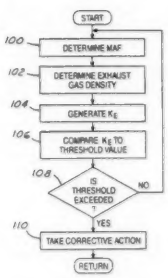
EXHAUST SYSTEM MONITOR

Kevin Verne Tallio, Saline; Timothy Chanko, Canton, both of Mich., and Yitzhak Isaac Henig, Essex, United Kingdom, assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Jan. 7, 2000, Appl. No. 479,547

Int. Cl. G01M *19/00*

U.S. Cl. 73—118.1 **12 Claims**



1. A method of monitoring exhaust gas flow through an exhaust system of an internal combustion engine including at least an exhaust gas aftertreatmen device, the method comprising the steps of:

generating a flow efficiency value as a ratio of a magnitude of exhaust gas flow restriction and mass flux through the engine;

comparing said flow efficiency value to a reference efficiency value; and

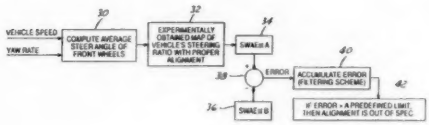
if the reference efficiency value is exceeded by a predetermined amount, then setting a flow efficiency indicator flag.

US 6,408,687 B1

MISALIGNMENT DETECTION SYSTEM FOR A STEERING SYSTEM OF AN AUTOMOTIVE VEHICLE

Behrouz Ashrafi, and Dinu Petre Madau, both of Dearborn, Mich., assignors to Visteon Global Technologies, Inc., Dearborn, Mich.

Filed Apr. 26, 2000, Appl. No. 558,773
Int. Cl. G01M *19/00*
U.S. Cl. 73—118.1 **19 Claims**


VEHICLE SPEED
YAW RATE
COMPUTE AVERAGE STEER ANGLE OF FRONT WHEELS
EXPERIMENTALLY OBTAINED MAP OF VEHICLE'S STEERING RATIO WITH PROPER ALIGNMENT
SWA(s) A
SWA(s) B
ERROR
ACCUMULATE ERROR (FILTERING SCHEME)
IF ERROR > A PREDEFINED LIMIT, THEN ALIGNMENT IS OUT OF SPEC

1. A misalignment detection system for a steering system comprising:

a velocity sensor generating a vehicle velocity signal indicative of a vehicle velocity;

a yaw rate sensor generating a yaw rate signal indicative of a vehicle yaw rate;

a memory of storing a steering ratio memory map and a historic steering wheel angle; and

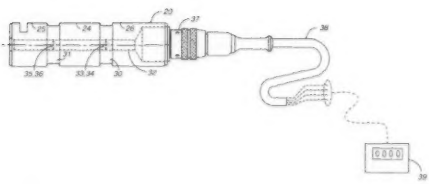
a controller coupled to the velocity sensor, the yaw rate sensor and the memory, the controller determining a base steering wheel angle when vehicle velocity is at a predetermined velocity, said base steering wheel angle being a function of vehicle velocity, yaw rate and a steering ratio, said controller comparing said base steering wheel angle with a historic steering wheel angle to determine an error.

US 6,408,688 B2

HEAVY TRUCK BRAKE SYSTEM USING INSTRUMENTED ANCHOR PINS

Timothy B. Foley, Audubon, and Robert S. Turzanski, Souderton, both of Pa., assignors to Strainsert Company, West Conshohocken, Pa.

Filed Jul. 16, 1999, Appl. No. 356,203
Int. Cl. G01L *5/28*
U.S. Cl. 73—129 **6 Claims**



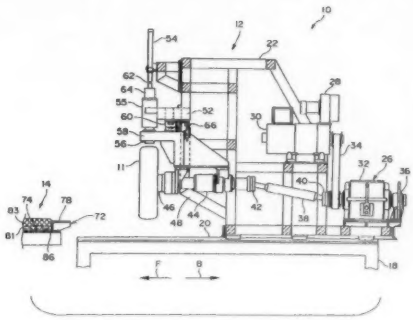
1. For use in an operating vehicle having brakes as part of an operating brake system: a force and torque measuring apparatus for use in said system, comprising: load bearing members; an anchor pin means as part of the load-bearing members; said anchor pin means having a plurality of force detecting load cells and measuring devices within said brakes; exterior measuring and monitoring instrumentation means; and connection means connected to said anchor pin means and said instrumentation means to permit measurement of applied brake loads as to either magnitude or direction or both, during vehicle and brake system operation.

US 6,408,689 B1

ON-SNOW TIRE-TESTING METHOD, ON-SNOW TIRE-TESTING SYSTEM, AND ROAD SURFACE FOR ON-SNOW TIRE TESTS

Koichi Usami; Kouichi Fukuda, and Kazuyuki Yamanoi, all of Tochigi, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Aug. 28, 2000, Appl. No. 650,428
Claims priority, application Japan, Aug. 31, 1999, 11-246368
Int. Cl. B60C *23/02*
U.S. Cl. 73—146 **26 Claims**



1. A method for testing tires on an artificial snow layer, comprising:

placing in a layered form and cooling an artificial snow including a granular water-absorbent material that has been made to expand by the addition of water; and

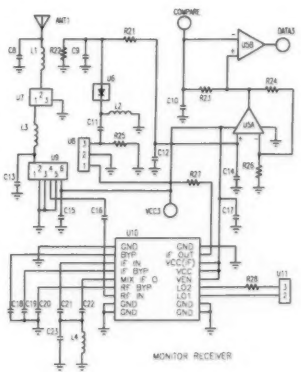
running a tire on the artificial snow layer.

US 6,408,690 B1

TIRE PRESSURE SENSORY MONITORING SYSTEM

Jorge A. Young, Claremont; Chander P. Mittal, Rowland Heights, and Joe Huayue Zhou, Hacienda Heights, all of Calif., assignors to CM Automotive Systems Inc., Walnut, Calif.

Filed Jun. 12, 2000, Appl. No. 592,500
Int. Cl. B60C *23/02*
U.S. Cl. 73—146.5 **11 Claims**



1. A system for monitoring a tire pressure of a tire of a vehicle, the system comprises a sensor module attached to the tire and comprises a monitor,

the sensor module comprising:

a motion switch for detecting when the vehicle is in motion at a minimum speed;

a sensor for sensing the tire pressure of the tire between the minimum speed and a maximum speed, and

a transmitter for retransmitting a message within a message time a plurality of times when the vehicle is in motion between the minimum speed and the maximum speed, a burst of a plurality of messages is retransmitted within a burst time, the message indicating the tire pressure, the message time being less than ½ duration of a revolution of the tire when rotating at a high rate corresponding to the maximum speed, the burst time being less than ½ duration of a revolution of the tire when rotating at a low rate corresponding to the minimum speed; the and

the monitor comprising:

a receiver for receiving the message.

US 6,408,691 B1

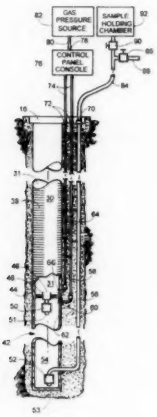
WELL MONITORING SYSTEM

Donald R. Sorben, 10351 Matador Ct., San Diego, Calif. 92124

Filed Nov. 27, 2000, Appl. No. 723,052

Int. Cl. E21B *43/00;49/10;43/12*

U.S. Cl. 73—152.23 **12 Claims**



1. A well monitoring apparatus for burial in the ground to sample and monitor subsurface water comprising:

a cylindrical bailer unit having a top end wall, a bottom end wall, and a side wall communicating with both of said top end wall and said bottom end wall;

a bailer reservoir chamber defined by the area between said top end wall, said bottom end wall and said sidewall;

an intake pipe, said intake pipe having an external end communicating with a fluid collection reservoir outside said bailer reservoir chamber, said intake pipe having an internal end located inside said bailer reservoir chamber,

a passageway communicating through said pipe from said internal end to said external end;

means to prevent flow through said passageway from said internal end toward said external end thereby allowing only flow from said external end to said internal end;

a discharge pipe, said discharge pipe having an entry end located in a lower end of said bailer reservoir chamber, and having an exit end located at a collection point outside said bailer reserviour chamber;

a conduit communicating through said discharge pipe from said entry end to said exit end;

means to prevent flow through said conduit from said exit end toward said entry end thereby allowing only flow through said conduit from said entry end toward said exit end;

means of pressurizing said bailer reservoir chamber for a determined time period of pressurization, whereby fluid collected in said fluid collection reservoir and communicated through said intake pipe to said bailer reservoir chamber is forced through said conduit in said discharge pipe and thereafter discharging at a collection point at said exit end of said conduit, during said determined time period of pressurization.

US 6,408,692 B1

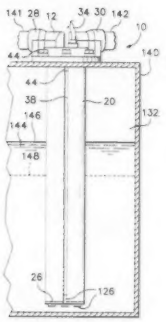
LIQUID LEVEL SENSOR

Gary W. Glahn, Eagle Creek, Oreg., assignor to Isspro, Inc., Portland, Oreg.

Filed Nov. 20, 1997, Appl. No. 975,180

Int. Cl. G08B *21/00*

U.S. Cl. 73—313 **19 Claims**



1. A combined liquid level sensor and liquid pickup and return, comprising:

an elongate housing that defines therein a pickup cavity, a return cavity and a substantially enclosed float cavity, said housing having a longitudinal axis, wherein said pickup cavity, said return cavity and said float cavity are sealed with respect to one another along said longitudinal axis; and

a float positioned within said substantially enclosed float cavity and adapted for movement therealong,

wherein said pickup cavity and said return cavity are substantially parallel to one another and substantially coextensive with one another,

wherein said float cavity is defined between said pickup cavity and said return cavity,

wherein said float cavity is substantially parallel to said pickup cavity and said return cavity, and

wherein said float cavity is substantially coextensive with said pickup cavity and said return cavity.

US 6,408,693 B1

FLUID LEVEL INDICATING DEVICE FOR ANY CONTAINER

Arthur G. Drinkwater, 95 Bay Dr., Key West, Fla. 33040

Filed Oct. 4, 2000, Appl. No. 679,048

Int. Cl. G01F *23/02*

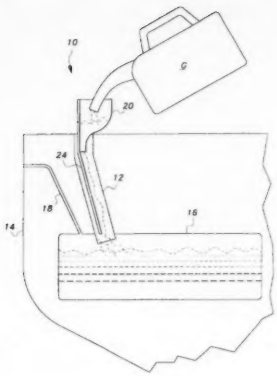
U.S. Cl. 73—323 **11 Claims**

1. A fluid level indicating device adapted for insertion into a fluid container to be filled, said device comprising:

a funnel, said funnel having an upper end, a lower end, an inner surface and an outer surface and a first wall;

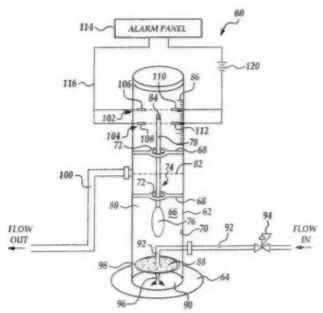
an opening disposed through said first wall;

an elongated tube, said tube having a first end and a second end; said tube positioned on said funnel inner surface; and



a venturi section formed in said tube adjacent said first end, said tube being transparent at least at said venturi section.

US 6,408,694 B1
APPARATUS AND METHOD FOR ON-LINE MONITORING OF A LIQUID DENSITY
Chun Chih Lin, Taipei; Lung-Chun Tsai; Ching Fang Kam, both of Hsin-Chu, and Han-Chang Lee, Taoyuan, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin Chu, Taiwan
Filed Nov. 29, 1999, Appl. No. 451,239
Int. Cl. G01N *9/18*
U.S. Cl. 73—444 **19 Claims**



1. An apparatus for on-line monitoring of a liquid density comprising:

an upright, cylindrical housing that is substantially transparent and fluid-tight defining a cavity therein,

a liquid inlet tube in fluid communication with a lower portion of said cavity,

a liquid outlet tube in fluid communication with a middle portion of said cavity,

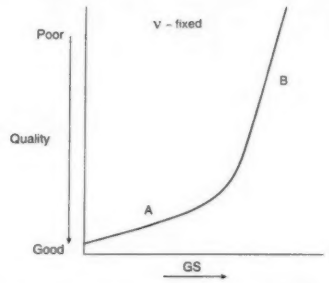
a stabilizing plate positioned at said lower portion of said cavity in said housing with said liquid inlet tube connected therethrough for feeding a liquid downwardly toward a bottom of said cylindrical housing, said stabilizing plate partially separates said lower portion of cavity from said cavity,

a quantity of liquid in said cavity having a top level substantially at the same elevation of said liquid outlet tube,

a density indicator constructed of a float and a measuring stick integrally joined together such that when the float is submerged in said liquid, the measuring stick is emerged above said top level of the liquid, and

at least two positioning guides fixedly attached to said cylindrical housing adapted for guiding said measuring stick in a substantially upright position.

US 6,408,695 B1
ULTRASONIC INSPECTION METHOD AND SYSTEM FOR DETECTING CRITICAL FLAWS
Bernard Patrick Bewlay, Schenectady; John Broddus Deaton, Jr., Niskayuna; Michael Francis Xavier Gigliotti, Jr., Scotia, and Robert Snee Gilmore, Charlton, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Dec. 3, 1999, Appl. No. 454,189
Int. Cl. G01N *3/32*
U.S. Cl. 73—579 **4 Claims**



1. A method for ultrasonically inspecting a titanium article for at least one critical flaw that acts as a non-Rayleigh scattering source of ultrasonic radiation, the method comprising the steps of:

a) selecting a frequency for detecting the at least one critical flaw, the at least one critical flaw being larger than a predetermined dimension;

b) providing the titanium article, the titanium article having a plurality of acoustic entities that generate only Rayleigh scattering of ultrasonic radiation, wherein each of the plurality of acoustic entities comprises a colony of αTi particles having a common crystallographic orientation;

c) directing ultrasonic energy of the selected frequency into the bulk of the titanium article;

d) detecting ultrasonic radiation scattered from the bulk of the titanium article; and

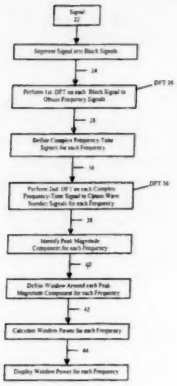
e) determining whether the ultrasonic radiation scattered is a result of one of predominantly Rayleigh scattering and non-Rayleigh scattering, wherein a determination that the ultrasonic radiation scattered is a result of non-Rayleigh scattering is indicative of the critical flaw.

US 6,408,696 B1
COHERENT PHASE LINE ENHANCER SPECTRAL ANALYSIS TECHNIQUE
Jen-Yi Jong, Huntsville, Ala., assignor to AI Signal Research, Inc., Huntsville, Ala.
Provisional application No. 60/169,113, filed on Dec. 6, 1999. This application Apr. 5, 2000, Appl. No. 543,657.
Int. Cl. G01H *9/00;* **G01R** *23/16*
U.S. Cl. 73—579 **27 Claims**

1. A method for detecting a periodic signal buried in wide-band noise in a signal using a CPLE power spectral density plot, comprising the steps of:

(a) segmenting the signal into a plurality of adjacent, equal-size, block signals;

(b) performing a first Discrete Fourier Transform on each block signal to obtain an ensemble of frequency signals, each frequency signal including complex data associated with frequency components;



(c) defining a complex frequency-time signal for each frequency component using the complex data from each frequency signal;

(d) performing a second Discrete Fourier Transform on each complex frequency-time signal to obtain an equivalent wave number signal for each frequency component;

(e) identifying a peak magnitude component for each equivalent wave number signal associated with each frequency component;

(f) defining a window around each peak magnitude component for each frequency component;

(g) calculating a window power for each frequency component;

(h) displaying the window power for each frequency component to obtain the CPLE power spectral density plot of the signal, wherein a peak component in the CPLE power spectral density plot represents the periodic signal.

US 6,408,697 B1

PRESSURE DETECTION APPARATUS WITH SQUEEZING PROTECTION MEMBER

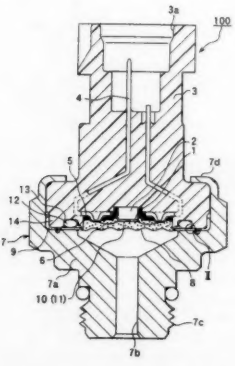
Seiichiro Ootake, Hazu-gun, and Kazuhiro Chiku, Kariya, both of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Mar. 9, 2000, Appl. No. 522,078

Claims priority, application Japan, Mar. 12, 1999, 11-066949; Feb. 23, 2000, 2000-052165

Int. Cl. G01L *7/00*

U.S. Cl. 73—714 **12 Claims**



1. A pressure detection apparatus comprising:

a main body having a first case, a second case, and a pressure detection chamber defined by assembling the first case and the second case;

an O-ring for liquid-tightly sealing the pressure detection chamber, being provided at an outer peripheral portion of the pressure detection chamber and being sandwiched by the first case and the second case; and

a wall portion being provided at opposite side of the pressure detection chamber with respect to the O-ring, including:

a first surface being contacted with the O-ring, for restricting a movement of the O-ring toward an outer peripheral direction when a pressure to be detected is applied to the pressure detection chamber; and

a second surface being contacted with one of the first case and the second case, and defining a corner portion with the first surface;

wherein a distance between an end of the first surface and the second surface is less than 0.1 mm.

US 6,408,698 B1

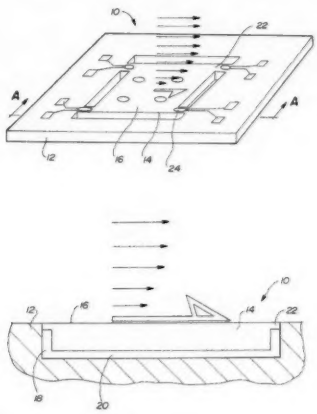
SENSORS AND METHOD FOR MEASUREMENT OF FLOW RATES AND CUMULATIVE FLOW IN DUCTS

Giles J. Brereton, Williamston; Harold J. Schock, Okemos; Ruby N. Ghosh, Okemos, and Fathi M. Salam, Okemos, all of Mich., assignors to Board of Trustees Operating - Michigan State University, East Lansing, Mich.

Provisional application No. 60/099,108, filed on Sep. 3, 1998. This application Aug. 31, 1999, Appl. No. 387,543.

Int. Cl. G01N *3/24;* **G01F** *1/28*

U.S. Cl. 73—841 **18 Claims**



1. A sensing mechanism capable of measuring shear stress resulting from an unsteady mass flow along a duct, comprising:

a support member disposed along an interior surface of said duct, said support member including a first exposed surface;

a floating pad including a first exposed surface;

a plurality of coupling members which suspend said floating pad over said support member, said coupling members including a first exposed surface wherein each of said exposed surfaces of said floating pad, support member and plurality of coupling members are disposed along a substantially common plane, with said interior surface of said duct;

a plurality of sensors fixedly coupled to said plurality of coupling members capable of measuring strain within the coupling members; and

a convolution integral circuit capable of accepting an output from said sensing mechanism and capable of performing a convolution integral with said surface force and a known mathematical function, such that said convolution integral

provides a mass flow value, said known mathematical function representing a fluid-mechanical behavior of said unsteady mass flow.

US 6,408,699 B1

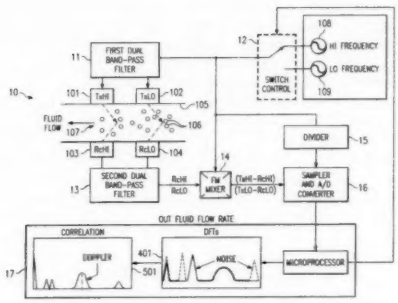
MULTIPLE FREQUENCY DOPPLER FLOW METER

Robert A. Moss, Sugarland, and Michael Masterov, Houston, both of Tex., assignors to Polysonics, Inc., Houston, Tex.

Filed Oct. 6, 1998, Appl. No. 166,989

Int. Cl. G01F *1/66*

U.S. Cl. 73—861.26 **35 Claims**



1. A method for determining a velocity of fluid flowing in a pipe, the method comprising the steps of:

transmitting a periodic electrical signal at a plurality of frequencies;

transducing said electrical signal into an ultrasonic signal;

transmitting, at a first point along said pipe, said ultrasonic signal into said fluid flowing in said pipe;

transducing, at a second point along said pipe, ultrasonic energy present at said second point along said pipe into electrical energy;

mixing said electrical energy with said transmitted periodic electrical signal, thereby generating a mixed signal;

sampling the mixed signal resulting from said mixing step, wherein said step of sampling has a sampling rate and produces sampling data;

determining a frequency representing the fluid velocity from said sampling data produced in said sampling step and;

calculating the fluid velocity from said frequency representing the fluid velocity, wherein the step of determining said frequency representing fluid velocity comprises the steps of:

generating frequency spectrum data from said sampling data produced in said sampling step for a plurality of frequencies of transmission of a periodic electrical signal, thereby generating a data set comprising energy values associated with individual frequency values, each data set being associated with a transmission frequency;

scaling the frequency values in each said data set by an amount inversely proportional to the transmission frequency associated with each said data set, thereby generating scaled frequency spectrum data associated with each transmission frequency;

correlating the scaled frequency spectrum data generated for all frequencies transmitted, thereby producing a correlation function, said function having a frequency range which includes a Doppler frequency distribution;

identifying said Doppler frequency distribution within said correlation function frequency range, said Doppler frequency distribution having a centroid frequency; and

isolating, from said Doppler frequency distribution, said frequency representing said fluid velocity.

US 6,408,700 B1

MASS FLOW RATE MEASUREMENT CIRCUIT AND METHOD FOR A MASS FLOW/DENSITY METER

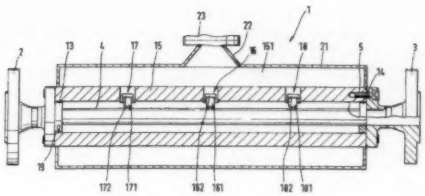
Christian Matt, Aesch, Switzerland, and Daniel Kuttler, Lörrach, Germany, assignors to Endress + Hauser Flowtec AG, Reinach, Switzerland

Provisional application No. 60/161,314, filed on Oct. 25, 1999. This application May 26, 2000, Appl. No. 579,384.

Claims priority, application European Pat. Off., Jun. 7, 1999, 99110860

Int. Cl. G01F *1/84*

U.S. Cl. 73—861.356 **22 Claims**



1. A Coriolis mass flow/density meter through which a fluid to be measured flows in a direction during operation, comprising:

a mass flow sensor having at least one flow tube through which the fluid to be measured can flow, said flow tube being configured to vibrate in operation at a frequency determined by its material and dimensions but varied by the density of the fluid;

a first and a second vibration sensor attached to said flow tube and positioned at a given distance from each other in the direction of flow, said sensors delivering a sinusoidal first and a sinusoidal second sensor signal, respectively;

a vibrator for vibrating the flow tube; and

a measurement circuit including

a first and a second impedance-matching device fed by the first and second sensor signal, respectively,

an intermediate switch having a first and a second input coupled to an output end of the first impedance-matching device and an output end of the second impedance-matching device, respectively,

a third and a fourth impedance-matching device coupled, respectively, to a first and a second output end of the intermediate switch,

a first low-pass filter coupled to an output end of the third impedance matching device, said first low-pass filter having a passband, and an upper cutoff frequency,

a second low-pass filter coupled to an output end of the fourth impedance matching device, said second low-pass filter having a passband, and an upper cutoff frequency, with the upper cutoff frequency of the first low-pass filter differing from the upper cutoff frequency of the second low-pass filter, and the passband covering at least the vibration frequency values occurring in operation;

a first zero-crossing detector coupled to an output end of the first low-pass filter;

a second zero-crossing detector coupled to an output end of the second low-pass filter;

a time-to-digital converter having a start input, a stop input, and a clock input and delivering a digital signal, the start input being coupled to an output end of the first zero-crossing detector, the stop input being coupled to an output end of the second zero-crossing detector;

a high-frequency clock generator having an output end coupled to the clock input of the time-to-digital converter; and

a microprocessor which generates a signal representative of mass flow rate from the digital signal and a signal representative of a calibration factor and controls the switching of the intermediate switch.

18. A method for measuring a mass flow rate of a fluid flowing through a pipe by means of a Coriolis mass flow/density meter, said method comprising the steps of:

vibrating a flow tube which is conducting said fluid;

detecting inlet-side and outlet-side vibrations of said flow tube for generating a first sensor signal representing said inlet-side vibrations and a second sensor signal representing said outlet-side vibrations, said sensor signals having a phase difference with respect to each other that varies with the mass flow rate; and

generating a measuring signal representing the mass flow rate to be determined by means of both sensor signals;

wherein said step of generating the measuring signal includes the steps of

generating a start signal and a stop signal by means of both sensor signals, said stop signal being delayed with respect to said start signal independent of the actual mass flow rate of said fluid, and

starting a time-to-digital converter by means of the start signal and stopping said time-to-digital converter by means of the stop signal for generating a digital signal that represents a time difference between said start signal and said stop signal.

US 6,408,701 B1

APPARATUS FOR MEASURING CONTAMINATION OF THE SURFACE OF A MACHINE SURFACE

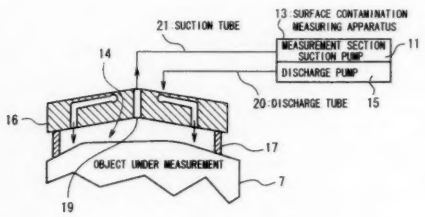
Ikuhiro Fujita, Kumamoto, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 9, 2000, Appl. No. 567,642

Claims priority, application Japan, May 12, 1999, 11-131585

Int. Cl. G01N *1/04*

U.S. Cl. 73—864.71 **9 Claims**



1. A surface contamination measuring apparatus comprising:

means for sucking in air from the proximity of an object under measurement;

a measurement section for measuring one of a quantity of, and a composition of, particles in the sucked in air;

a discharging means for discharging a fluid onto a surface of said object under measurement;

a sampling member brought into proximity with a surface of said object under measurement and connected to the means for sucking in air and the discharging means of discharging a fluid; and

a blocking member made of a flexible material being provided at about the outer periphery of said sampling member,

wherein said flexible material comprises a plurality of separate individual members each having substantially rectangular shapes, and disposed continuously so that a part of each individual one thereof overlaps with another.

2. A surface contamination measuring apparatus comprising:

means for sucking in air from the proximity of an object under measurement;

a measurement section for measuring one of a quantity of, and a composition of, particles in the sucked in air;

a discharging means for discharging a fluid onto a surface of said object under measurement

a sampling member brought into proximity with a surface of said object under measurement and connected to the means for sucking in air and the discharging means of discharging a fluid; and

a blocking member made of a flexible material being provided at about the outer periphery of said sampling member,

wherein said flexible material comprises a plurality of separate individual substantially vertical elements disposed continuously around a circumference of the sampling member and disposed to conformally contact the surface of the object to be measured with a substantially light contact as brushes.

3. A surface contamination measuring apparatus comprising:

means for sucking in air from the proximity of an object under measurement;

a measurement section for measuring one of a quantity of, and a composition of, particles in the sucked in air;

a discharging means for discharging a fluid onto a surface of said object under measurement;

a sampling member brought into proximity with a surface of said object under measurement and connected to the means for sucking in air and the discharging means of discharging a fluid; and

blocking member made of a flexible material being provided at about the outer periphery of said sampling member, wherein said flexible material comprises a thin sheet attached along one edge of the sampling member.

US 6,408,702 B1

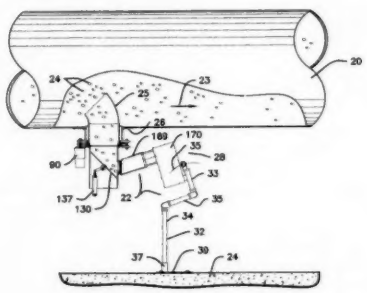
WOOD PROCESSING DRIER SENSOR

Lum C. Gaither, and Wesley Harbour, both of Hot Springs, Ark., assignors to Automated Control Engineering Inc., Hot Springs, Ark.

Filed Jun. 1, 1999, Appl. No. 323,216

Int. Cl. G01N *1/00*

U.S. Cl. 73—864.81 **16 Claims**



1. A device for sampling a stream of particulate material moving in a flow path through a tubular conduit, said device comprising:

hood means penetrating said conduit, the hood means comprising an open ended sample-intake spout and an opposite end in fluid flow communication through the device;

means for rotating said hood means between an upstream position with the spout facing the flow path to captivate samples and a downstream position for returning said samples into the flow path;

valve means for selectively closing said device when said hood means faces upstream and for venting said device when said hood means faces downstream;

valve housing means in fluid flow communication with said hood means for mounting said valve means;

means for selectively displacing said valve means between a closed position for obtaining said samples and an open position for returning the samples to the flow path within the conduit;

a sample collection compartment formed within said valve housing means by the closed valve means for temporarily holding samples of materials to be monitored;

moisture determining means for testing samples captivated within said collection compartment;

wherein said valve housing means comprises an inspection window adjacent said sample collection compartment, and said moisture determining means comprises means for reading sample moisture through said inspection window; and,

circuit means for activating said means for rotating said hood means to rotate said hood means between operative positions and for opening said valve means so that samples that have been tested are returned via suction to the conduit flow path, and wherein, after tested samples have been returned to the conduit flow path, said circuit means closes said valve means and causes said means for rotating said hood means to return the hood means into a position to again take a sample so the sequence may repeat.

US 6,408,703 B2

APPARATUS FOR CARRYING OUT A WEIGHT MEASUREMENT IN CENTRIFUGES

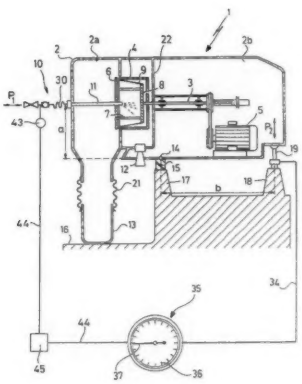
Hans Gerteis, Bietigheim-Bissingen, Germany, assignor to Heinkel Aktiengesellschaft, Bietigheim-Bissingen, Germany

Division of application No. 09/482,774, filed on Jan. 13, 2000, now Pat. No. 6,314,824, which is a continuation of application No. PCT/EP98/03123, filed on May 27, 1998. This application Oct. 11, 2001, Appl. No. 974,949.

Claims priority, application Germany, Jul. 25, 1997, 197 32 006

Int. Cl. G01G *19/52*

U.S. Cl. 73—865 **1 Claim**



1. An apparatus for carrying out a weight measurement in a centrifuge for separating a suspension into solid and liquid components, comprising a machine housing, a drum rotatingly mounted in said machine housing and receiving said suspension, and a filler pipe leading into said drum for feeding said suspension into said drum, said machine housing being mounted for pivotal movement about an axis of rotation, and a force measuring element sensing weight-dependent deflections of said machine housing occurring about said axis of rotation and originating from a different degree of filling of said drum with suspension or from a different dewatering of said solid suspension components, and said machine housing deflections being indicated on a measurement value indicator, wherein said drum is closable with a lid, said filler pipe is provided on the feed side of said drum for generating a positive pressure or a negative pressure in said drum, and a sensor sensing the pressure in said drum on the feed side corrects said measurement value indicator in correspondence with the pressure.

US 6,408,704 B1

AERODYNAMIC PARTICLE SIZE ANALYSIS METHOD AND APPARATUS

Klaus Willeke, 147 Ritchie Ave., Cincinnati, Ohio 45215-2062

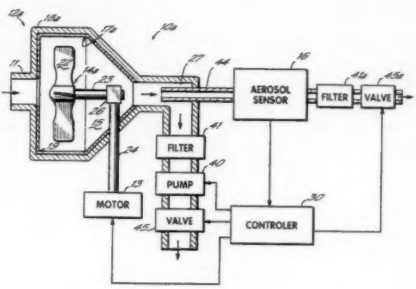
PCT No. PCT/US99/02138, § 371 Date Aug. 14, 2000, § 102(e) Date Aug. 14, 2000, PCT Pub. No. WO99/41588, PCT Pub. Date Aug. 19, 1999

PCT Filed Feb. 1, 1999, Appl. No. 555,007

This patent is subject to a terminal disclaimer.

Int. Cl. G01N *15/00*

U.S. Cl. 73—865.5 **38 Claims**



1. A method for determining the concentrations, in an aerosol that includes air and airborne particles, of the airborne particles as a function of their aerodynamic particle sizes. the method comprising the steps of:

flowing aerosol into an aerodynamic cut device having a rotating element that at successively higher rotational speeds makes aerodynamic cuts at successively smaller aerodynamic particle sizes by centrifugally removing particles larger than the respective aerodynamic cut;

flowing particles smaller than the aerodynamic cut size into an optical sensor; and

with said optical sensor, recording aerosol concentrations as a function of the aerodynamic particle sizes determined by said aerodynamic cut device.

US 6,408,705 B1

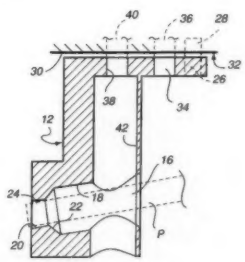
MOUNTING BLOCK FOR A PROXIMITY PROBE USED FOR MEASURING AXIAL MOVEMENT OF A ROTOR

Anthony Constantine Thermos, Greer, S.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 28, 2000, Appl. No. 726,228

Int. Cl. G08G *5/04*

U.S. Cl. 73—866.5 **11 Claims**



1. A turbine comprising a rotor supported by a plurality of bearings, at least one of said bearings having an end cap; a mounting block for locating a measuring device in proximity to a surface of the rotor, said mounting block comprising a substantially vertically oriented body portion having a bore adjacent one end of said body oriented at an acute angle relative to a longitudi-

nal axis of said rotor, said bore adapted to receive a forward end of a measuring device, and a mounting flange portion at an opposite end of said body portion securing the mounting block to a surface of the end cap.

US 6,408,706 B1

ROTATION STOP DEVICE AND ELECTRIC ACTUATOR HAVING ROTATION STOPPING FUNCTION

Shigekazu Nagai, Tokyo, and Yousuke Shirai, Ibaraki-ken, both of Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan

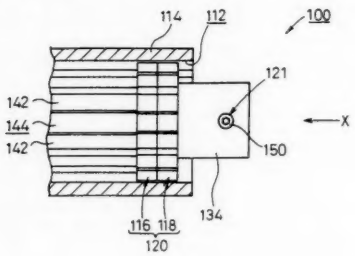
PCT No. PCT/JP98/05344, § 371 Date Jun. 2, 2000, § 102(e) Date Jun. 2, 2000, PCT Pub. No. WO99/28653, PCT Pub. Date Jun. 10, 1999

PCT Filed Nov. 27, 1998, Appl. No. 554,620

Claims priority, application Japan, Dec. 2, 1997, 9-331811; Dec. 2, 1997, 9-332222

Int. Cl. F16H *25/20;* **B25G** *3/28;* **F16C** *29/02*

U.S. Cl. 74—89.33 **16 Claims**



1. A rotation-preventive device for preventing rotation during relative sliding movement by making engagement between a boss section which is formed with a hole and a spline shaft section which is inserted into said hole and which is formed with spline grooves, said rotation-preventive device comprising:

a first spine shaft member and a second spline shaft member which are provided coaxially with each other and which are formed by dividing said spline shaft section in a direction substantially perpendicular to an axis thereof; and

a clearance-adjusting mechanism for adjusting a clearance in a circumferential direction between an inner wall surface of said boss section and an outer wall surface of said spline shaft section by rotating and displacing said first spline shaft member and said second splint shaft member in mutually opposite directions about a center of rotation of said axis, wherein said spline shaft is slidably disposed in said hole of the boss section after said first spline shaft and said second spline shaft have been rotated and displaced for setting said clearance.

US 6,408,707 B1

BEVEL GEAR MECHANISM AND ELECTRIC POWER STEERING SYSTEM USING IT

Yukihide Kimura; Hideo Osanai, both of Susono; Kei Takakuwa, Chiryu; Yoshikazu Kameda; Norihiro Yoshida, both of Susono; Yoshimi Kajitani, Toyota; Naohito Ino, Anjo; Katsutoshi Mizuno, Handa, and Takatomo Kutsuna, Anjo, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, and Nissei Corporation, Anjo, both of Japan

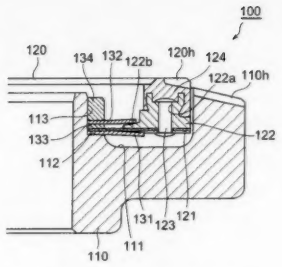
Filed Nov. 13, 2000, Appl. No. 709,719

Claims priority, application Japan, Nov. 30, 1999, 11-340539

Int. Cl. F16H *55/18*

U.S. Cl. 74—409 **7 Claims**

1. A bevel gear mechanism used for transmitting power between two axes not parallel to each other, said bevel gear mechanism comprising:



a first bevel gear of a ring shape having teeth projecting on one disk surface side;

a second bevel gear of a ring shape arranged to be concentric with said first bevel gear and having teeth placed on a concentric circle basis on the same surface side as the teeth of said first bevel gear;

a support member for substantially restraining rotation of the second bevel gear relative to said first bevel gear and for elastically supporting the second bevel gear relative to said first bevel gear so that in a free state the teeth of said second bevel gear can project relative to the teeth of said first bevel gear in a direction of a rotation axis and so that in a pushed state, when the teeth of said second bevel gear is pushed to the first bevel gear side in the direction of the rotation axis, the teeth of said second bevel gear can be retracted to the first bevel gear side; and

a fluctuation suppressing member extending between the second bevel gear and the first bevel gear for suppressing fluctuation of said second bevel gear relative to said first bevel gear along a predetermined diameter direction.

US 6,408,708 B1

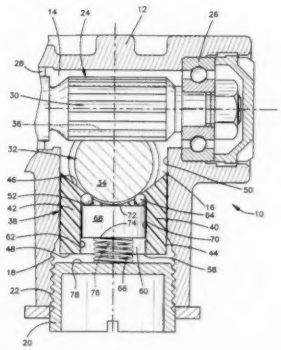
RACK AND PINION STEERING GEAR WITH LOW FRICTION YOKE ASSEMBLY

Paul R. Sahr, Lake Orion, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Aug. 10, 2000, Appl. No. 636,018

Int. Cl. F16H *1/04*

U.S. Cl. 74—422 **5 Claims**



1. A rack and pinion steering gear comprising:

a housing;

a pinion gear rotatably mounted in the housing;

a rack bar movable relative to the pinion gear, the rack bar having teeth in meshing engagement with the pinion gear; and

a yoke assembly in the housing for supporting and guiding movement of the rack bar relative to the pinion gear,

the yoke assembly comprising a yoke and a plurality of balls,

the yoke having a first surface and a plurality of slots which intersect the first surface,

each ball being located and remaining in a respective slot, each ball projecting from its respective slot and beyond the first surface of the yoke when load conditions on the yoke assembly are below a predetermined level,

each ball being movable in its respective slot relative to the first surface of the yoke as load conditions on the yoke assembly change.

US 6,408,709 B2

CABLE BLOCK-LOCKING MECHANISM FOR DUAL MODE SHIFT LEVER UNIT

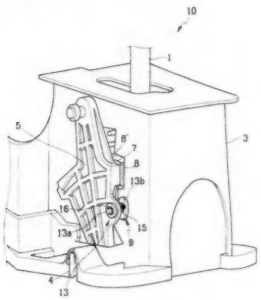
Hyung-Suk Kim, Kyungki-do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Dec. 14, 2000, Appl. No. 737,610

Claims priority, application Rep. of Korea, Dec. 28, 1999, 99-63651

Int. Cl. F16H *59/02;63/36*

U.S. Cl. 74—473.18 **4 Claims**



1. An automotive dual mode shift lever unit comprising:

a lever housing;

a lever bracket mounted at a lower end of a shift lever for pivotally connecting the shift lever to a pivot shaft in the lever housing;

a cable block pivotally mounted on the pivot shaft outside the lever housing; and

a cable block-locking mechanism interposed between the lever bracket and the cable block,

wherein the cable block locking mechanism comprises:

a stud slidably mounted to the cable block for selectively connecting the cable block with the lever housing;

a push rod formed on the lever bracket for depressing the stud so as to release the cable block from the lever housing in an automatic mode; and

a return spring mounted around the stud for returning the stud such that a the cable block is coupled to the lever housing in a manual mode.

US 6,408,710 B1

INDUSTRIAL ROBOT HAVING CONVECTION COOLED FREQUENCY CONVERTERS

Ove Kullborg, and Einar Myklebust, both of Västerås, Sweden, assignors to ABB AB, Vasteras, Sweden

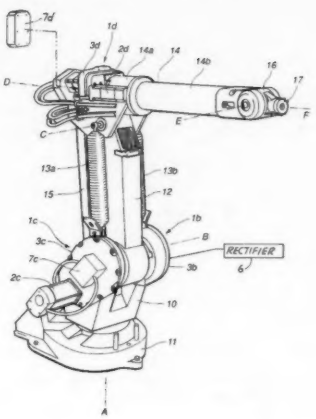
Continuation-in-part of application No. 08/604,465, filed on Feb. 21, 1996, now abandoned. This application Jan. 15, 1998, Appl. No. 69,192.

Claims priority, application Sweden, Feb. 24, 1995, 9500683

Int. Cl. B25J *13/00*

U.S. Cl. 74—490.03 **2 Claims**

1. An industrial robot comprising a manipulator body structure of articulated members mounted for rotative movement about respective axes thereof, drive means at each of said axes to effect



the respective rotative movements, each of said drive means comprising at least one electric driving motor capable of operating up to a predetermined maximum temperature without the use of a cooling fan, control equipment means for driving and controlling each of said respective drive means, said respective control equipment means comprising at least one rectifier and drive devices each capable of withstanding heat generated up to a maximum temperature of approximately one-half the predetermined maximum temperature of the motor likewise without the use of any cooling fan, said drive devices being operatively connected respectively to said motors, each of said drive devices being mounted only on selected areas of said body structure other than at each said motor, and each of said drive devices being spaced a predetermined distance from said respective motors to which said drive devices are operatively connected, said body structure thereby functioning to absorb the waste heat generated by said drive devices, to spread the waste heat throughout the body structure, and to transfer the waste heat solely by convection to the ambient air.

US 6,408,711 B1

BRAKE PEDAL APPARATUS OF VEHICLE

Hiroyuki Mizuma, Kanagawa-ken; Naoyuki Sugiyama, Tokyo; Masaharu Ishizuki, Kanagawa-ken, and Jun Sato, Tochigi-ken, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa-Ken, and F. Tech Incorporation, Tochigi-ken, both of Japan

Filed Jun. 30, 2000, Appl. No. 608,166

Claims priority, application Japan, Jul. 2, 1999, 11-189554; Dec. 28, 1999, 11-375844

Int. Cl. G05G *1/14*

U.S. Cl. 74—512 **12 Claims**

1. A brake pedal apparatus of a vehicle comprising:

a pedal bracket having a shaft and a first fixed portion to be fixed to a first vehicle body member at the front thereof;

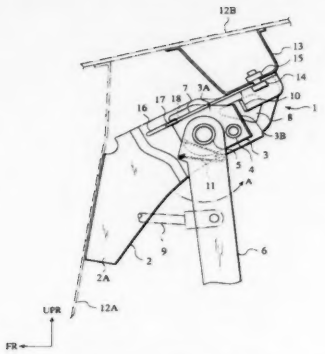
a pivot bracket rotatably pivoted to the shaft and provided with a pedal shaft apart from the shaft in a longitudinal direction of the vehicle;

a pedal arm rotatably pivoted to the pedal shaft;

a lock plate having an engagement portion allowing relative movement thereof with respect to at least the pivot bracket when a backward input over a predetermined load is applied to the pedal bracket and engaging with the pivot bracket in a normal state; and

a rotation promoting member promoting a rotational operation of the pivot bracket,

wherein when the backward input over the predetermined load is applied to the pedal bracket, whereby the lock plate relatively moves, an engagement between the pivot bracket



and the lock plate is disconnected and the pivot bracket is downward rotated around the shaft.

US 6,408,712 B1

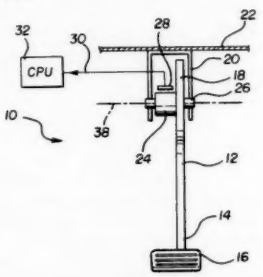
PEDAL ASSEMBLY WITH NON-CONTACT PEDAL POSITION SENSOR FOR GENERATING A CONTROL SIGNAL

Venkata Ramana Bolisetty, Sterling Heights, and James S. Baughman, Deford, both of Mich., assignors to Teleflex Incorporated,, Plymouth Meeting, Pa.

Provisional application No. 60/159,663, filed on Oct. 15, 1999, Provisional application No. 60/192,210, filed on Mar. 27, 2000. This application Jun. 23, 2000, Appl. No. 603,136.

Int. Cl. G05G *1/14*

U.S. Cl. 74—514 **3 Claims**



1. A pedal assembly adapted to be mounted on a body structure of a motor vehicle and operative to generate a control signal for vehicle system, said assembly comprising:

a support adapted to be mounted to the body structure;

a pedal arm having an upper end pivotally mounted to said support for movement relative to the body structure and a lower end for supporting a pedal pad, said pedal arm being movable between a plurality of operational positions as a force is applied to said pedal pad;

a magnet including multiple poles and cylindrical in shape with each of said poles having a predetermined width with said poles alternating between positive and negative orientations about the circumference of said magnet and

a non-contact sensor mounted adjacent to said magnet such that said sensor remains fixed relative to said pedal arm at all operational positions wherein said sensor generates an electric control signal for controlling a vehicle system as said pedal arm is moved between said operational positions, said signal varying in magnitude by the extent of angular rotation of said magnet relative to said sensor,

a non-rotatable pivot shaft fixed to said support and defining an axis of rotation for said pedal arm to pivot between operational positions,

a transversely extending shaft for supporting said magnet and rotatably supported on said pivot shaft, said transversely extending shaft being concentric by being disposed about said pivot shaft, whereby said transversely extending shaft rotates about said pivot shaft about said axis of rotation as said pedal arm is moved between operational positions.

US 6,408,713 B1

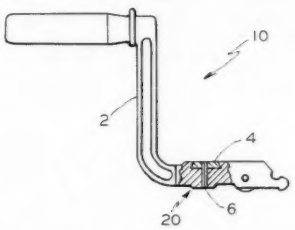
LOCOMOTIVE BRAKE VALVE HANDLE WITH WEAR PAD

Matthew D. Mitsch, Pittsburgh, Pa., assignor to Westinghouse Air Brake Technologies Corporation, Wilmerding, Pa.

Filed Jun. 2, 2000, Appl. No. 586,046

Int. Cl. G05G *1/00*

U.S. Cl. 74—545 **20 Claims**



1. A handle assembly for use in a locomotive brake valve of a railway braking system, said handle assembly comprising:

(a) a handle member, having a predetermined configuration, for manually adjusting such brake valve to various positions;

(b) a cavity having a predetermined shape and a predetermined width formed in said handle member at least adjacent a top surface thereof and adjacent an elongated slot formed in a housing of such brake valve;

(c) a wear pad mounted in said cavity of said handle member for frictional engagement with such slot; and

(d) a means for securing said wear pad to said handle member.

US 6,408,714 B1

ROTARY DEVICE FOR STUNT BICYCLES

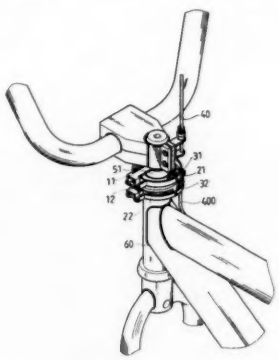
Yung-Pin Kuo, No. 55, Alley 121, Lane 175, Kuo Shen Rd., Chang Hwa City, Taiwan

Filed Feb. 1, 2001, Appl. No. 774,692

Claims priority, application Taiwan, Dec. 8, 2000, 089221365

Int. Cl. B62K *21/12*; **F16C** *1/10*

U.S. Cl. 74—551.1 **9 Claims**



1. A rotary device for stunt bicycles, comprising:

a bearing set adapted to be movably mounted to a steerer tube and having two upright lugs and two downward lugs;

a first collar adapted mounted to the steerer tube, a first connection portion and a second connection portion respectively radially extending outward from said first collar, said two upright lugs pivotally connected to said first collar;

a first lever member having a ring portion adapted to be mounted to the steerer tube, a first connection port and a second connection port respectively radially extending outward from said first lever member, said first connection port adapted to allow a first brake cable to pass and said first connection portion of said first collar adapted to be connected to the first brake cable, said second connection port pivotally connected to said second connection portion of said first collar;

a second collar adapted mounted to the head tube, a third connection portion and a fourth connection portion respectively radially extending outward from said second collar, said two downward lugs pivotally connected to said second collar, and

a second lever member having a ring portion adapted to be mounted to the head tube, a third connection port and a fourth connection port respectively radially extending outward from said second lever member, said third connection port adapted to allow a second brake cable to pass and said third connection portion of said second collar being adapted to be connected to the second brake cable, said fourth connection port pivotally connected to said fourth connection portion of said second collar.

US 6,408,715 B1

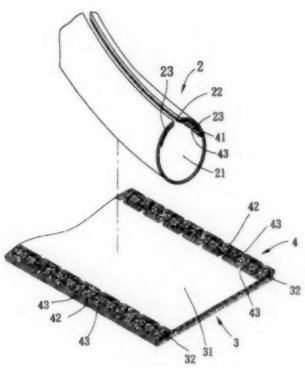
STEERING WHEEL COVER

Yuan-Yuan Huang, No. 33, Lane 75, Sec. 2, Chung-Cheng N. Rd., Kuei-Jen Hsiang, Tainan Hsien, Taiwan

Filed Aug. 24, 2000, Appl. No. 644,534

Int. Cl. B62D *1/06*

U.S. Cl. 74—558 **4 Claims**



1. A steering wheel cover comprising:

an annular hollow core layer with a generally C-shaped radial cross-section and formed from a shape-retaining resilient material, said core layer confining an annular receiving space, and having an inner annular peripheral edge that is formed with a slot therealong to permit access into said receiving space, said core layer further having an outer wall surface, and an inner wall surface with opposing edge parts disposed respectively adjacent to opposite lateral edges of said slot;

a flexible lining layer having a covering portion that lines said outer wall surface of said core layer, and a pair of marginal portions disposed respectively on opposing lateral sides of said covering portion, said marginal portions extending into said receiving space of said core layer via said slot, and overlapping respectively said edge parts of said inner wall surface of said core layer; and

a hook-and-loop fastening unit provided on said edge parts of said inner wall surface of said core layer and on said marginal portions of said lining layer to fasten removably said lining layer to said core layer, wherein said fastening unit includes a pair of first fastening strips secured respectively to said edge parts, and a pair of second fastening strips secured respectively to said marginal portions, said second fastening strips engaging removably and respectively said first fastening strips so as to fasten removably said lining layer to said core layer.

US 6,408,716 B1

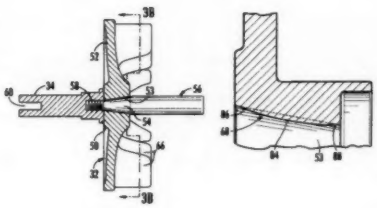
MAGNETO FLYWHEEL HAVING IMPROVED KEY

Russell D. Phelon, Aiken, S.C., assignor to R.E. Phelon Company, Inc., Aiken, S.C.

Filed May 12, 2000, Appl. No. 570,246

Int. Cl. F16F *15/315;* **F16B** *3/00*

U.S. Cl. 74—572 **12 Claims**



1. A flywheel mountable to a drive shaft of an internal combustion engine, said flywheel comprising:

a flywheel body including a central hub portion and an integral wheel portion;

said hub portion of said flywheel body defining an axial bore, said drive shaft being received in said axial bore when said flywheel is mounted thereon; and

an integral key located in said axial bore for receipt in a corresponding keyway defined in said drive shaft, said integral key being formed without lateral stress reliefs such that opposed side walls extend directly from an inside surface of said axial bore about a radius located at a respective base of each said side wall.

US 6,408,717 B1

TWIN MASS FLYWHEELS

Alastair John Young, Kenilworth, and Robert John Murphy, Leamington Spa, both of United Kingdom, assignors to AP TMF Limited, Leamington Spa, United Kingdom

PCT No. PCT/GB98/01334, § 371 Date May 14, 1999, § 102(e) Date May 14, 1999, PCT Pub. No. WO98/51940, PCT Pub. Date Nov. 19, 1998

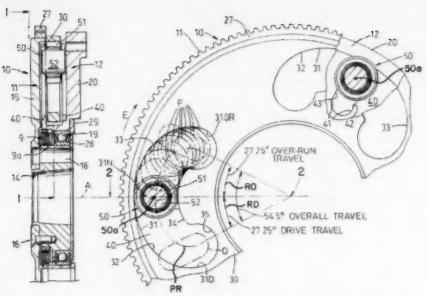
PCT Filed May 8, 1998, Appl. No. 214,232

Claims priority, application United Kingdom, May 9, 1997, 9709436; Jul. 18, 1997, 9715027

Int. Cl. F16F *15/10;* **F16D** *23/00;3/12;3/14;3/52*

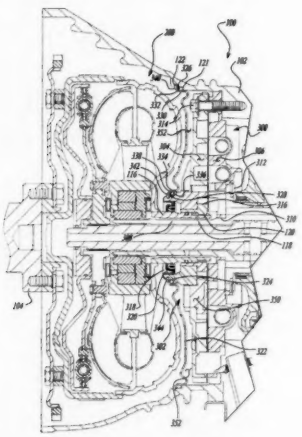
U.S. Cl. 74—574 **18 Claims**

1. A twin mass flywheel comprising a first flywheel mass in connection with an engine and including a first track which extends generally circumferentially part way around the first flywheel mass and a second flywheel mass in connection with a transmission and including a second track extending at an angle relative to the first track, the masses being rotatable relative to each other about an axis through a limited angle and this relative rotation being controlled by connection means which engages with and moves along the first and second tracks and whose center of gravity moves radially with respect to the axis as the first and second flywheel



masses rotate relative to each other, the centripetal loads acting on the connection means as the twin mass flywheel rotates tending to reverse said relative rotation of the masses to restore the masses towards a predetermined relative rotational zone thus damping torsional vibrations between the engine and transmission.

US 6,408,718 B1
STAMPED PUMP COVER
Thomas D. Nogle, Troy, Mich., assignor to DaimlerChrysler Corporation, Auburn Hills, Mich.
Filed Mar. 31, 1999, Appl. No. 282,376
Int. Cl. F16H *57/02*
U.S. Cl. 74—606 R **3 Claims**



1. A pump cover for use in a transmission of a vehicle, the transmission having a transmission housing and a fluid pump disposed within the transmission housing, the fluid pump having a pump housing defining an outer recess, the transmission housing defining an inner recess, said pump cover comprising:

a generally circular plate having a centrally disposed aperture, said generally circular plate defining an outer portion and an inner portion, said outer portion of said generally circular plate adapted to engage the inner recess of the transmission housing, said inner portion of said generally circular plate adapted to engage the outer recess of the pump housing,

wherein said generally circular plate is adapted to cooperate with the transmission housing and the pump housing to enclose and seal a fluid volume adjacent the fluid pump, thereby minimizing the need for fluid seals within the fluid pump;

an outwardly-turned L-shaped portion extending from said outer portion of said generally circular plate;

an inwardly-turned L-shaped portion extending from said inner portion of said generally circular plate;

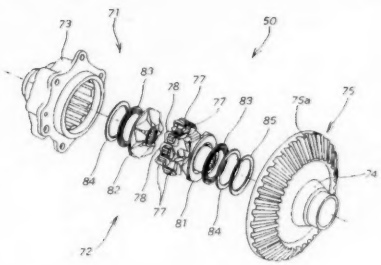
an outer sealing member adapted to be disposed between said outwardly-turned L-shaped portion of said outer portion and the transmission housing within said inner recess, said outer sealing member adapted to provide a fluid seal between the transmission housing and said generally circular plate;

an inner sealing member adapted to be disposed between said inwardly-turned L-shaped portion of said inner portion and the pump housing within said outer recess, said inner sealing member adapted to provide a fluid seal between the pump housing and said generally circular plate;

an outer retaining ring adapted to engage said outer portion of said generally circular plate and an inner channel of the transmission housing, said outer retaining ring preventing said generally circular plate from disengaging from the transmission housing; and

an inner retaining ring adapted to engage said inner portion of said generally circular plate and an outer channel of the pump housing, said inner retaining ring preventing said generally circular plate from disengaging from the pump housing.

US 6,408,719 B1
DIFFERENTIAL MECHANISM
Bunzo Seki; Akio Handa; Yasuhiro Higashi; Akio Senda; Kazushiro Inoue, all of Wako, and Satoru Noguchi, Shizuoka-pref, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, and F.C.C. Co., Ltd., Shizuoka-pref, both of Japan
Filed Sep. 1, 2000, Appl. No. 654,275
Claims priority, application Japan, Sep. 2, 1999, 11-249215
Int. Cl. F16H *48/12*
U.S. Cl. 74—650 **4 Claims**



1. A differential mechanism comprising:

a differential case assembly having a casing body connected to a source of drive force and a toothed cap member coupled with said casing body to cover one opened end of said casing body;

a plurality of input blocks housed in said case assembly and being movable circumferentially of said case assembly in correspondence with rotation of said casing body;

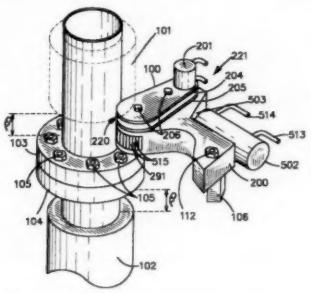
a pair of output cam members for clamping said input blocks relatively slidably and being independently rotatable owing to a frictional force produced with respect to each of said input blocks to thereby initiate a differential motion on an output side of said differential mechanism:

said input blocks being provided in at least two different types and having projected portions, said projected portions of said input blocks of one type having a first upper end width, said projected portions of said input blocks of another type having a second upper end width different from said first upper end width; and

said casing body having first and second axial grooves formed on an inner peripheral surface thereof such that they extend axially of said differential mechanism, said first axial grooves being shaped complementarily to the projected portions of the input blocks of one type having a first upper end width for fitting engagement therewith, said second axial grooves being

shaped complementarily to the projected portions of the input blocks of said another type having a second upper end width different from said first upper end width.

US 6,408,720 B2
OFFSET HYDRAULIC RUNNER APPARATUS
Bobby W. Collins, 825 Holiday Ct., Kenner, La. 70065; Robert Decker, 1509 Carroll St., Kenner, La. 70062; Don Clover, 4903 Waterbeck Dr., Fulshear, Tex. 77441, and Michael Shirey, 4819 Baudin St., New Orleans, La. 70119
Continuation-in-part of application No. 09/302,836, filed on Apr. 30, 1999, now abandoned. This application Dec. 1, 2000, Appl. No. 728,528.
Int. Cl. B25B *21/00*
U.S. Cl. 81—57.39 **25 Claims**



1. A wrench assembly for loosening or tightening a threaded member in a confined space, comprising:

(a) a first non-manual wrench configured to engage and rotate a threaded member; and

(b) a second wrench comprising:

(i) a motor;

(ii) a runner driver configured to engage said threaded member, said runner driver operatively connected to said motor, whereby said runner driver and said threaded member may be rotated independently of said first wrench; and

(iii) a housing extending substantially horizontally between said motor and said runner driver,

wherein said confined space has a vertical dimension that is less than the sum of the vertical dimension of said motor, said runner driver, and said housing, but greater than the sum of the vertical dimensions of said first wrench and said housing.

US 6,408,721 B1
WRENCH HAVING A RETRACTABLE HANDLE
Jack Lee, No. 53, Nan Shi Keng, Da Nan Village, Mei Shan Hsiang, Jia Yi Hsien, Taiwan
Filed May 30, 2000, Appl. No. 584,023
Int. Cl. B25B *13/46;23/16*
U.S. Cl. 81—60 **1 Claim**

1. A wrench comprising:

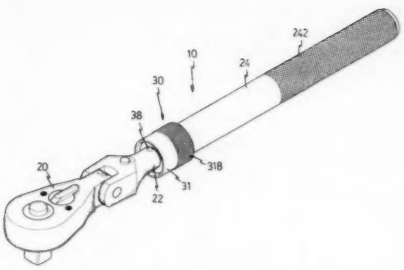
a wrench body;

an elongated shank mounted on said wrench body, said shank having an outer periphery defining a plurality of annular retaining grooves;

an elongated retractable handle telescopically and slidably mounted on said shank, a knurl formed on an outer periphery of said retractable handle; and

an adjusting device mounted between said shank and said retractable handle for adjustably securing said retractable handle on said shank, said adjusting device including:

a plurality of locking balls each movably mounted in a first end of said retractable handle and each detachably secured in one of said retaining grooves of said shank;



an adjusting ring slidably mounted on said first end of said retractable handle and having a first end defining a receiving recess and a second end defining a chamber provided with an annular abutting flange, a knurl formed on an outer periphery of said adjusting ring, wherein, said adjusting ring is slidable on said first end of said retractable handle between a first position where each of said locking balls is pressed by an inner wall of said adjusting ring to be received in one of said retaining grooves of said shank for positioning said retractable handle on said shank, and a second position where each of said locking balls is introduced into said receiving recess of said adjusting ring to detach from said one retaining groove, thereby releasing and detaching said retractable handle from said shank such that said retractable handle is slidable on said shank, and wherein said receiving recess of said adjusting ring includes a tapered guide neck for introducing each of said locking balls into said receiving recess;

a plurality of abutting beads each secured in an outer periphery of said first end of said retractable handle and each received in said chamber of said adjusting ring;

a biasing member mounted on said retractable handle, received in said chamber of said adjusting ring and pressed between said abutting flange and said abutting beads; and

a limiting ball secured in said shank and abutting said first end of said retractable handle for limiting said first end of said retractable handle.

US 6,408,722 B1
RATCHET WHEEL MOUNTING ARRANGEMENT FOR WRENCH
Yu-Tang Chen, No. 252, Chen Hsin Rd., Taichung, Taiwan
Filed Sep. 20, 2001, Appl. No. 955,970
Int. Cl. B25B *13/46*
U.S. Cl. 81—60 **1 Claim**

1. A ratchet wheel mounting arrangement comprising

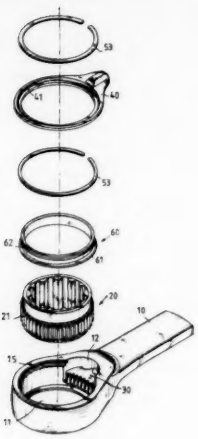
a wrench body, said wrench body comprising a box at one end thereof, an annular locating groove disposed in said box at a top side, a sector-like recess disposed in said box at one side, and a horizontal blind hole disposed in said sector-like recess;

an internally serrated annular ratchet wheel mounted in said box of said wrench body, said ratchet wheel comprising a series of sloping teeth arranged around a periphery thereof and sloping in one direction;

a stop block mounted in said sector-like recess of said wrench body and adapted to control a direction of rotation of said ratchet wheel in said box, said stop block having a toothed engagement face disposed at a front side thereof and engaged with the sloping teeth of said ratchet wheel and a recessed locating hole disposed at a back side thereof;

a spring-supported positioning means mounted in said blind hole of said wrench body and engaged into the recessed locating hole of said stop block to support said stop block in engagement whit the sloping teeth of said ratchet wheel;

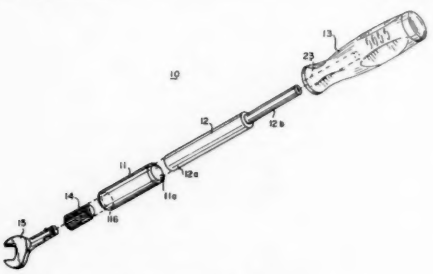
a cover plate covered on said box of said wrench body to hold said ratchet wheel and said stop block inside said box and said sector-like recess of said wrench body; and



a fastening structure fastened to said box of said wrench body to secure said cover plate and said ratchet wheel to said box of said wrench body;

wherein said cover plate has an annular inside locating groove extended along an in side wall thereof; said fastening structure comprises a hoop sleeved onto the periphery of said ratchet wheel and stopped above said sloping teeth of said ratchet wheel, said hoop comprising an outward bottom flange protruded from a periphery thereof at a bottom side and an outside annular groove extended along the periphery thereof at a top side, a first C-shaped retainer ring mounted in the annular locating groove of said box of said wrench body and forced into engagement with the outward bottom flange of said hoop, and a second C-shaped retainer ring mounted in the annular locating groove of said box of said wrench body and the annular inside locating groove of said cover plate and forced into engagement with the outside annular groove of said hoop.

US 6,408,723 B1
INSULATING COMPOSITE SHAFT TOOL WITH INTERCHANGEABLE HEADS AND METHOD OF CONSTRUCTION THEREOF
Gregory A. Zurbuchen, Kenosha, Wis., assignor to Snap-on Technologies, Inc., Lincolnshire, Ill.
Filed Jul. 28, 2000, Appl. No. 627,935
This patent is subject to a terminal disclaimer.
Int. Cl. B25B *13/02*
U.S. Cl. 81—119 **12 Claims**



1. An electrically insulating tool comprising:

a shaft formed from a hollow tube and a rod, one end of the rod received in one end of the tube, the tube and the rod formed of an electrically insulating non-metallic material;

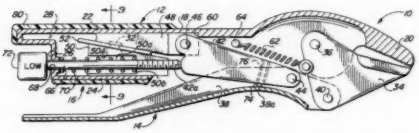
an electrically insulating handle connected to the rod at an end opposite the tube;

an insert received in an end of the tube opposite the rod and having therein a cavity generally

D-shaped in transverse cross section;

a work-engaging head receivable in the cavity and detachably coupled to the insert, and an electrically insulating sheath covering the head.

US 6,408,724 B1
SELF-ADJUSTING PLIER-TYPE LOCKING TOOL
Carlton L. Whiteford, Westport, Conn., assignor to Adjustable Clamp Company, Chicago, Ill.
Filed Mar. 18, 1996, Appl. No. 618,263
Int. Cl. B25B *7/12*
U.S. Cl. 81—367 **16 Claims**



1. A self-adjusting locking tool comprising, in combination:

an elongated first handle provided at a forward end with a stationary jaw and at a rearward end with a housing, wherein said housing has upper and lower surfaces parallel both to each other and to a long axis of said first handle and a rear wall;

a movable jaw pivotally connected to said forward end of said first handle and operable to coact with said stationary jaw;

an elongated second handle pivotally secured at one end to said movable jaw with the other end thereof extending rearwardly;

a toggle link pivotally secured on one end to said second handle with the other end thereof extending rearwardly toward said housing, wherein said toggle link has a rearwardly facing shoulder formed thereon at a location forward of its said other end;

a hinged wedge having a thick end and a thin end slidably disposed in said housing and pivotally connected at its thick end to said other end of said toggle link;

a floating wedge having a thick end and a thin end slidably disposed in said housing and separated from said hinged wedge by a floater plate, said wedges being arranged with the thin end of said floating wedge and the thick end of said hinged wedge facing toward said jaws;

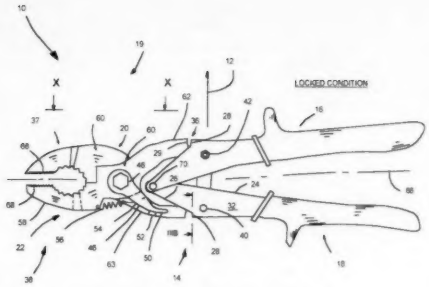
means for magnetically attracting said hinged and floating wedges into contact with said floater plate with sufficient force to wipe away any oil that may be present on mating surfaces of said floater plate and wedges while still allowing said floater plate to slide relative to said wedges;

means positioned in said wrench for resiliently urging said floating wedge forwardly toward said jaws; and

means on the thin end of said floating wedge for engaging the rearwardly facing shoulder on said toggle link to force said floating wedge rearwardly as the rearward end of said toggle link moves rearwardly upon movement of said second handle toward said first handle.

US 6,408,725 B1
PLIERS
Paul M. Janson, 19151 Tulsa St., Northridge, Calif. 91326
Provisional application No. 60/285,047, filed on Apr. 20, 2001.
This application Jun. 12, 2001, Appl. No. 879,264.
Int. Cl. B25B *7/04*
U.S. Cl. 81—407 **32 Claims**

1. Improved pliers for gripping work pieces of different sizes requiring different separation angles between jaw faces as determined by a user, said improved pliers comprising:



jaw means for gripping the work piece, said jaw means comprising upper and lower jaw members;

a manually adjustable slip-joint, said manually adjustable slip-joint operably connected to said jaw means for providing rotation and/or translation, said manually adjustable slip-joint providing at least two predetermined maximum jaw opening positions of the upper and lower jaw members by selective adjustment, by said selective adjustment, the jaw members may be moved from one separation angle to another, the selective adjustment occurring with minimum movement of handles of said improved pliers;

biasing means for providing a continuous force to the upper and lower jaw members, said biasing means responding to said selective adjustment of said manually adjustable slip-joint by the user;

handle means, said handle means comprising an upper and lower handles operably connected to the upper and lower jaw members, respectively; and

means for limiting the separation of the upper and lower handles, said biasing means cooperatively acting with said means for limiting and said handle means to move said upper and lower jaw members in predetermined directions;

whereby the user selects a separation angle of said jaw means necessary for gripping a given work piece by manually adjusting the slip-joint.

US 6,408,726 B1

SHEET METAL WORK CENTER WITH A MOVABLE LOWER DIE OPERATIVE AS A STOPPER AND AN UPWARDS FORMING TOOL

Jorma Taijonlahti, Yliharma, and Mikael Ollikainen, Lappeenranta, both of Finland, assignors to Lillbacka Jetair OY, Kauhava, Finland

PCT No. PCT/FI96/00626, § 371 Date Dec. 2, 1997, § 102(e) Date Dec. 2, 1997, PCT Pub. No. WO97/21504, PCT Pub. Date Jun. 19, 1997

PCT Filed Nov. 19, 1996, Appl. No. 894,129

Claims priority, application Finland, Dec. 14, 1995, 955989

Int. Cl. B21D *5/01*

U.S. Cl. 83—563 **18 Claims**

1. Sheet working center comprising:

a body;

a work table whereon a sheet to be worked is placed;

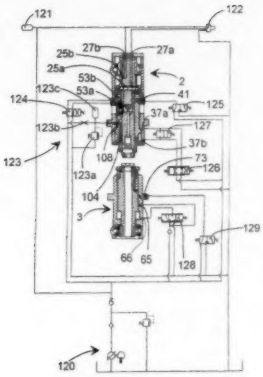
means for holding and moving said sheet on said table;

upper and lower tools for working on opposite sides of said sheet at a working level; and

a transfer device for moving said lower tool in a direction perpendicular to the plane of said sheet, said lower tool being mounted in said transfer device which is movable along said direction relative to said body, said lower tool being movable by said transfer device to at least the following positions relative to said body

a) a first position below said working level whereat said lower tool is accessible for exchange and/or maintenance;

b) a second position whereat said lower tool is positioned substantially at said working level for cooperating with said upper tool to work on said sheet; and



c) a third position whereat said lower tool is positioned below said working level and movable therefrom to said working level to work on said sheet.

US 6,408,727 B1

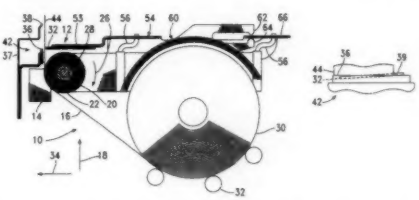
PAPER CUTTER USING A BLADE LIFTING MECHANISM

Richard Hunter Harris; Jeff David Thomas, and Kevin Hunter Vorhees, all of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 12, 2000, Appl. No. 481,353

Int. Cl. B26D *5/08*

U.S. Cl. 83—566 **20 Claims**



1. Apparatus for feeding a paper web, and for cutting said paper web into segments, wherein said apparatus comprises:

a stationary knife blade;

a moving knife blade;

a blade holder holding said moving knife blade and moving with said moving knife blade;

a drive cam including a first cam surface turning in engagement with said blade holder, moving an edge of said moving knife blade in a first direction across and edge of said stationary knife blade to cut said paper web with said paper web extending between said moving knife blade and said stationary knife blade, and subsequently moving said edge of said moving knife blade opposite said first direction;

a paper feed roll feeding said paper web;

a cam driving clutch mandrel;

a paper feed driving clutch mandrel;

a paper feed driven clutch mandrel connected to turn said paper feed roll;

a motor driving said cam driving clutch mandrel and said paper feed driving clutch mandrel in a cam driving direction, and opposite said cam driving direction;

a cam driving tab extending from said drive cam adjacent said cam driving clutch mandrel;

an interposer tab extending from said blade holder adjacent said cam driving clutch mandrel;

a cam driving clutch spring extending around said cam driving clutch mandrel, wherein said cam driving clutch spring

includes a first end tab extending outward to engage a first side of said cam driving tab and said interposer tab, wherein said cam driving clutch spring engages said cam driving clutch mandrel when a force is applied to said first end tab opposite said cam driving direction, and wherein said cam driving clutch spring disengages said cam driving clutch mandrel when a force is applied to said first end tab in said cam driving direction; and

a paper feed driving clutch spring extending around said paper feed driving clutch mandrel and said paper feed driven clutch mandrel, wherein said paper feed driving clutch spring engages said paper feed driven clutch mandrel to turn said paper feed driven clutch mandrel with said paper feed driving clutch mandrel when said paper feed driving clutch mandrel is driven opposite said cam driving direction.

US 6,408,728 B1

PUNCHING APPARATUS FOR STAMPING AND METHOD FOR PRODUCING THE SAME

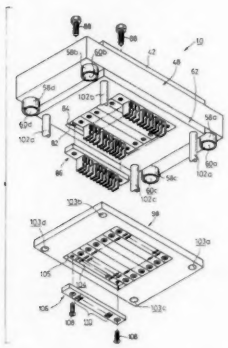
Hiroyuki Tsuji, Nagoya; Kazumasa Kitamura; Motoo Noritake, both of Ichinomiya; Satoshi Matsubayashi, and Shusaku Kabe, both of Kitakyusyu, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Sep. 22, 1999, Appl. No. 401,227

Claims priority, application Japan, Sep. 25, 1998, 10-271329

Int. Cl. B26F *1/14*

U.S. Cl. 83—687 **4 Claims**



1. A punching apparatus for applying perforating machining to a workpiece by using punch members, said apparatus comprising:

a punch holder secured to an upper die, said punch holder having a plurality of longitudinal holes formed therein, wherein each of said plurality of longitudinal holes has a rectangular cross section;

a die member secured to a lower die;

a plurality of grip members detachably fastened to said punch holder, said plurality of grip members each having a rectangular cross section corresponding to that of said longitudinal holes, and a plurality of grooves formed on at least two opposing side walls of said rectangular cross section, wherein each of said grip members is fitted to said punch holder with a gap such that crosspieces formed between said grooves on said side walls of each said grip member have a circular arc-shaped configuration and slidably contact with side walls of each respective longitudinal hole, such that the position of each grip member relative to said punch holder is determined by the position of each respective longitudinal hole.

US 6,408,729 B1

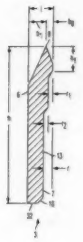
STEEL RULE FOR SCRAP MATERIAL EJECTION DIE

Michael J. Johnson, 1669 Lou Graham, El Paso, Tex. 79936

Filed Aug. 18, 1999, Appl. No. 376,437

Int. Cl. B26F *1/14;1/44;* **B26D** *7/18*

U.S. Cl. 83—697 **17 Claims**



1. A strip of sharpened and heat-treated rule for use in a cutting die comprising:

a lower base section;

an offset beveled upper portion having a cutting edge, a minor bevel and a major bevel;

a first substantially planar vertical sidewall extending from the lower base section to the beveled upper portion, said first sidewall being on the side of the rule having the major bevel, said major bevel intersecting said first sidewall at a first height;

a second sidewall extending from the lower base section to the beveled upper portion, said second sidewall being on the side of the rule having the minor bevel, said minor bevel intersecting said second sidewall at a second height, said second height being above said first height, wherein said second sidewall laterally approaches the first sidewall in at least one region from the second height downward to the first height.

US 6,408,730 B1

SEPARATING DEVICE WITH CUTTING CHAIN FOR PROCESSING SANDWICH PANELS

Andreas Tinner, Igis, and Matthias Accola, Fanas, both of Switzerland, assignors to Trumpf GmbH & Company, Ditzingen, Germany

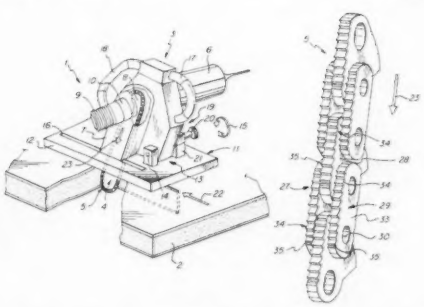
PCT No. PCT/EP99/06067, § 371 Date Jul. 3, 2000, § 102(e) Date Jul. 3, 2000, PCT Pub. No. WO00/10782, PCT Pub. Date Mar. 2, 2000

PCT Filed Aug. 19, 1999, Appl. No. 530,229

Claims priority, application Germany, Aug. 15, 1998, 298 15 228 U

Int. Cl. B27B *33/14*

U.S. Cl. 83—832 **16 Claims**



1. A cutting device for cutting a sandwich plate (**2**) and having a housing (**3**) with a support plate (**12**) and a motor-driven cutting tool (**5**) rotatably supported in a guide mechanism in the housing to

move in a cutting direction and cut through the sandwich plate (**2**), said cutting tool having cutting elements that move together in a common path of movement extending transversely of the plate on said support plate (**12**), wherein said cutting tool is an endless cutting chain (**5**) with said cutting elements comprising chain links (**27**, **28**, **29**) arranged in three adjacent rows comprising a middle row and two outer rows and wherein said guide mechanism is a chain guide (**4**), said chain links (**27**, **28**, **29**) being pivotably coupled so that adjacent links in the path of movement (**23**) of said chain can pivot relative to one another on pivot axes extending transversely of the path of movement, each of said links in each of said rows having several cutting teeth (**34**) which project in a radial direction on the cutting chain (**5**) and have cutting edges (**35**) which extend in a direction transversely of the path of movement of the chain links (**27**, **28**, **29**), said links having leading and trailing ends in the path of movement of said chain, said cutting edges (**35**) of the teeth in each link lie along an imaginary line (**36**, **37**) curved radially outwardly of said cutting chain, and the links (**28**) of said middle row have their leading and trailing ends in the path of movement (**23**) overlapping the ends of the trailing and leading ends of the links (**27**, **29**) of said outer rows, the adjacent links in the three rows of the chain are pivotably connected to one another by connecting bolts (**30**) which extend through one end portion of said outer rows and one end portion of the link of said middle row.

US 6,408,731 B1

LIQUID DISRUPTER WITH REDUCED RECOIL

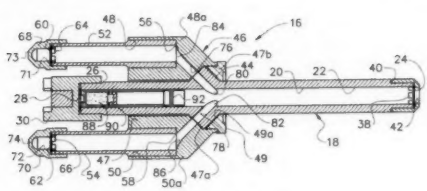
Josef Elsener, Carignan, Canada, assignor to Proparms Ltd., Carignan, Canada

PCT No. PCT/CA99/00539, § 371 Date Nov. 15, 2000, § 102(e) Date Nov. 15, 2000, PCT Pub. No. WO99/64808, PCT Pub. Date Dec. 16, 1999

Provisional application No. 60/088,835, filed on Jun. 10, 1998. This PCT application Jun. 9, 1999, Appl. No. 700,412.

Int. Cl. F42B *33/00;* **F41A** *25/00*

U.S. Cl. 86—50 **16 Claims**



1. A liquid disrupter for deactivating a bomb comprising:

a main elongated hollow barrel having a rigid cylindrical body with an inner chamber, a closed rear end and an opened front end closed with a front frangible seal;

a channel member having a bore engaged by said barrel, said channel member being securely attached to said barrel;

at least two recoil channels equally peripherally spaced about said barrel, said recoil channels having a first end extending through said barrel cylindrical body and opening inside said barrel inner chamber at a section thereof intermediate said front and rear ends, and a second end rearwardly opening out of said channel member and closed with rear frangible seals, said recoil channels radially outwardly and rearwardly extending through said barrel cylindrical body and said channel member from said first to said second ends;

a remotely selectively controlled trigger member operatively mounted to said barrel;

wherein in operation, an explosive charge is to be placed inside said barrel inner chamber near said rear end and connected to said trigger member, and said barrel body inner chamber and said recoil channels are to be filled with fluid, and wherein upon the explosive charge exploding when it is detonated by said trigger member, a portion of the fluid is ejected at high velocity frontwardly out of said barrel front end, rupturing said front frangible seal, to puncture the bomb outer shell and deactivate the bomb inner detonating components, and another portion of the fluid concurrently engages said recoil channels, rupturing said rear frangible seals, to be rearwardly ejected out of said channels, which at least partly counteracts the rearward recoil resulting from the explosive charge projecting the water frontwardly out of said barrel;

wherein each said recoil channel includes a first and a second channel sections, said first channel section extending through said barrel and said channel member in a radially outwardly and rearwardly inclined fashion relative to said barrel, and said second channel section being a recoil tube securely attached to said channel member and rearwardly projecting from said first channel section, said recoil channel second end being located at the rear end of said recoil tube; and

wherein each said recoil tube is provided with transverse blades at its rear end, for wide angle dispersal of the fluid jet being ejected out of said recoil tubes.

US 6,408,732 B1

CLIMBING NET

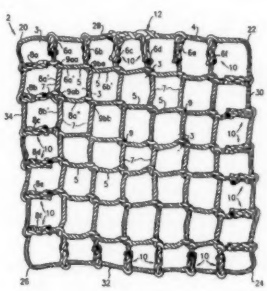
John Rexroad, 146 Grassy Hill Rd., Old Lyme, Conn. 06371, and Merle Kingham, 8966 E. Voltaire Dr., Scottsdale, Ariz. 85254

Filed Nov. 17, 1993, Appl. No. 153,623

This patent is subject to a terminal disclaimer.

Int. Cl. D04G *1/00*

U.S. Cl. 87—12 **11 Claims**



1. A net of the type having horizontally disposed rungs and vertically disposed rails comprising:

a border comprised of an elongated member having first and second ends spliced together to create an enclosing area defined by first, second, third and fourth corners;

a first border portion extending between said first and second corners, a second border portion extending lengthwise between said second and third corners, a third border portion extending between said third and fourth corners and a fourth border portion extending lengthwise between said fourth and first corners;

a plurality of weft members arranged in a row in spaced relationship to one another along one of said first, second, third and fourth border portions, said plurality of weft members being connected to on e of said first, second, third and fourth border portions by splicing each of said weft members at one end thereof into the associated border portion to which it is connected, at least one of said plurality of weft members being differently colored from the remaining ones of saled plurality of weft members;

two side by side ones of said plurality of weft members which are arranged in a row in spaced relationship to one another along one of said first, second, third and fourth border portions being of a different color taken relative to the color of at least one other weft arranged in said row in spaced relationship to one another along said one of said first, second, third and fourth border portions;

a plurality of warp members connected in a row in spaced relationship to one another along another of said first, second,

third and fourth border portions which is orthogonally disposed relative to said one of said first, second, third and fourth border portions of said border to which said plurality of weft members are connected, said plurality of warp members being connected to the one of said first, second, third and fourth border portions by splicing each of said warp members at one end thereof into the associated border portion to which it is connected, two side by side ones of said plurality of warp members which are arranged in said row in spaced relationship to one another along one of said first, second, third and fourth border portions being differently colored from the color of at least one other of the remaining ones of said plurality of warp members in said row;

said weft and said warp members together creating horizontally extending rungs and vertically extending rails by the interconnection of weft and weft members, warp and warp members and weft and warp members such that each weft and each warp member makes up at least one rung and one rail of the net; and

said at least one of said weft and warp members of a different color taken relative to the color of said at least one other weft and warp member displaying a diagonally directed path along the net relative to the differently colored ones of the warp and weft members.

US 6,408,733 B1

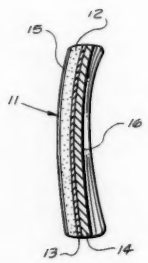
CERAMIC ARMOR APPARATUS FOR MULTIPLE BULLET PROTECTION

William J. Perciballi, 910 E. Mountain Sky Ave., Phoenix, Ariz. 85048

Filed Feb. 14, 2000, Appl. No. 503,494

Int. Cl. F41H *5/04;5/08;1/02*

U.S. Cl. 89—36.02 **24 Claims**



1. Ceramic armor apparatus comprising in combination:

a ceramic facing element with thickness of 0.080-inches to 0.310 inches;

an adhesive layer with thickness ranging from 0.002-inches to 0.090-inches; and

an aramid fiber composite substrate with thickness of 0.130-inches to 0.350-inches; the aramid fiber composite substrate comprising aramid fiber fabric in a plain, basket, or twill weave style with a basis weight between 3.5- and 20.0-ounces-per-square-yard.

US 6,408,734 B1

COMPOSITE ARMOR PANEL

Michael Cohen, Kibbutz Kfar Etzion, Mobile Post, North Yehuda 90200, Israel

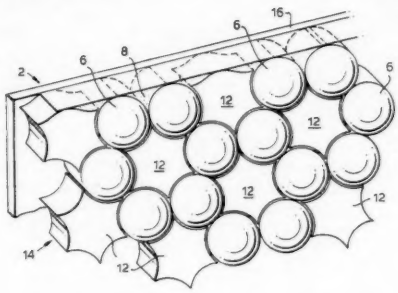
PCT No. PCT/IL99/00126, § 371 Date Oct. 6, 2000, § 102(e) Date Oct. 6, 2000, PCT Pub. No. WO99/53260, PCT Pub. Date Oct. 21, 1999

PCT Filed Mar. 4, 1999, Appl. No. 673,013

Claims priority, application Israel, Apr. 14, 1998, 124085

Int. Cl. F41H *5/02*

U.S. Cl. 89—36.02 **4 Claims**



1. A composite armor plate for absorbing and dissipating kinetic energy from high velocity, armor-piercing projectiles, as well as from soft-nosed projectiles, said plate comprising a single internal layer of high density ceramic pellets, characterized in that said pellets are arranged in a single layer of adjacent rows and columns, wherein a majority of each of said pellets is in direct contact with at least four adjacent pellets and each of said pellets are substantially cylindrical in shape with at least one convexly-curved end face, further characterized in that spaces formed between said adjacent cylindrical pellets are filled with a material for preventing the flow of soft metal from impacting projectiles through said spaces, said material being in the form of a triangular insert having concave sides complimentary to the convex curvature of the sides of three adjacent cylindrical pellets, or being integrally formed as part of a special interstices-filling pellet, said pellet being in the form of a six sided star with concave sides complimentary to the convex curvature of the sides of six adjacent cylindrical pellets, said pellets and material being bound and retained in plate form by a solidified material, wherein said solidified material and said plate material are elastic.

US 6,408,735 B1

ACTUATOR

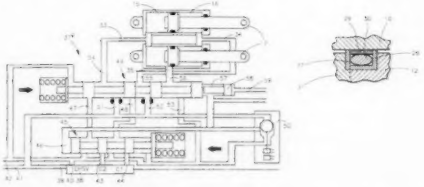
John H Harvey, Wolverhampton, and Timothy Hudson, Telford, both of United Kingdom, assignors to Lucas Industries Limited, United Kingdom

Filed May 18, 2000, Appl. No. 573,896

Claims priority, application United Kingdom, May 19, 1999, 9911526

Int. Cl. F01B *7/20*

U.S. Cl. 91—51 **20 Claims**



1. An actuator comprising a piston slidable within a cylinder, the piston member defining with the cylinder a first chamber and a

second chamber, said piston member being provided with a seal arrangement, forming a seal between said piston member and said cylinder, the effective cross-sectional area of said piston member exposed to the fluid pressure within said first chamber being greater than that exposed to the fluid pressure within the second chamber, first and second ports whereby fluid can be supplied to said first and second chambers, respectively, and a third port located intermediate said first and second ports,

wherein said seal arrangement has both a sealing element and at least one bearing member, the bearing member providing a durable bearing surface which defines a metering edge which is co-operable with said third port to throttle the rate at which fluid is able to escape from said first and second chambers through said third port, in use.

US 6,408,736 B1

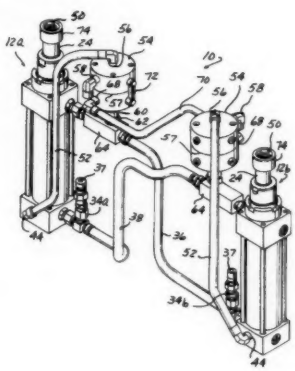
SYNCHRONIZING CYLINDER ASSEMBLY WITH EQUAL DISPLACEMENT HYDRAULIC CYLINDER

Douglas J. Holt, Livonia, and Robert C. Adams, Jr., Romeo, both of Mich., assignors to Welker Bearing Company, Troy, Mich.

Provisional application No. 60/143,423, filed on Jul. 13, 1999. This application Jul. 13, 2000, Appl. No. 615,428.

Int. Cl. F01B *25/04*

U.S. Cl. 91—171 **12 Claims**



1. A synchronizing cylinder assembly for synchronizing at least two external devices having a movable member with reciprocal movement at the same rate such that the devices stay level to each other within a small deviation the assembly comprising:

a hydraulic cylinder for each external device, wherein each hydraulic cylinder communicates with the other hydraulic cylinder in a closed circuit system, said hydraulic cylinder comprises a piston slidable within the hydraulic cylinder and a piston rod projecting from the rod end of the cylinder, said piston rod dividing the interior of the cylinder into a rod outer diameter chamber, a rod inner diameter chamber and a third chamber, wherein the rod outer diameter chamber and the rod inner diameter chamber houses hydraulic fluid and said third chamber is open to atmosphere for receiving atmospheric air, wherein each direction of the reciprocal movement, the hydraulic fluid in the rod outer diameter chamber of one of the hydraulic cylinders flows to the rod inner diameter chamber of the other hydraulic cylinder while the hydraulic fluid in the outer diameter chamber of the other hydraulic cylinder flows to the rod inner diameter chamber of the one hydraulic cylinder.

US 6,408,737 B1

CONTROL METHOD FOR A HYDRAULIC DRIVE, AND A CONTROL DEVICE CORRESPONDING THERETO

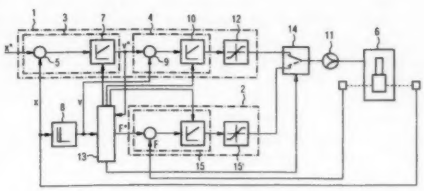
Stefan Kuenzel, Erlangen, and Thomas Grohmann, Poxdorf, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 20, 2000, Appl. No. 693,743

Claims priority, application Germany, Oct. 29, 1999, 199 52 266

Int. Cl. F15B *9/03*

U.S. Cl. 91—363 R **26 Claims**



1. A control method for a hydraulic drive which is moved via a control branch, comprising:

determining whether the hydraulic drive has come to a standstill; and

upon detection of the standstill, applying a force value dependent on a desired direction of movement to the hydraulic drive, via a force precontroller connected in parallel with the control branch, as a function of the desired direction of movement.

US 6,408,738 B1

ASSISTED BRAKING SYSTEM WITH EMERGENCY BRAKING FUNCTION

Ralf Harth, Darmstadt; Holger Von Hayn, Bad Vilbel; Jürgen Schonlau, Walluf; Hans-Jörg Feigel, Rosbach, and Steffen Linkenbach, Eschborn-Niederh öchstadt, all of Germany, assignors to Continental Teves AG & Co., OHG, Frankfurt, Germany

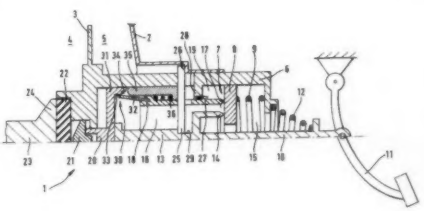
PCT No. PCT/EP99/05096, § 371 Date May 16, 2001, § 102(e) Date May 16, 2001, PCT Pub. No. WO00/13953, PCT Pub. Date Mar. 16, 2000

PCT Filed Jul. 16, 1999, Appl. No. 786,843

Claims priority, application Germany, Sep. 9, 1998, 198 41 150

Int. Cl. F15B *9/10*

U.S. Cl. 91—369.2 **14 Claims**



1. Brake force booster with a panic brake function for automotive vehicles, comprising:

a booster housing having its inner space subdivided, by a movable partition wall, into a vacuum chamber and a working chamber,

a control housing connected to the partition wall, said control housing including a control valve which controls the pressure in the working chamber, said control valve being operable by means of an input member, wherein said control valve includes a vacuum sealing seat on a sliding sleeve movable

relative to the control housing for the purpose of controlling the connection between the working chamber and the vacuum chamber,

an atmosphere sealing seat designed on a valve piston connected to the input member for controlling the connection between the working chamber and the atmosphere,

an elastic valve member cooperating with the vacuum and atmospheric sealing seats, wherein a quick actuation of the input member results in exceeding of a predetermined relative displacement between the valve piston and the control housing and, hence, the lifting of the atmosphere sealing seat from the valve member causes an abrupt rise of the boosting force which is transmitted from the control housing to a reaction member, to which the brake force transmitted from the valve piston by way of a thrust piece member is also applied,

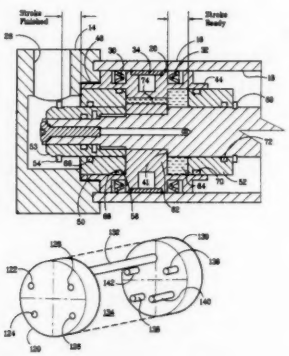
a clutch device which serves for supporting the sliding sleeve in the brake actuation direction on the reaction member, the clutch device including a supporting member on a side towards the reaction member and a clutch member on a side of the sliding sleeve, wherein the clutch member is adapted to move into engagement with the supporting member and is disengaged by withdrawing the valve piston in opposition to the direction of brake actuation,

wherein the supporting member is configured as a component part which transmits the brake force.

US 6,408,739 B1
PNEUMATIC CYLINDER WITH INTERNAL LIQUID DAMPENING MEANS

Steven Chamulak, Canton, and Michael A. Ferkany, White Lake, both of Mich., assignors to ACE Controls, Inc., Farmington, Mich.

Provisional application No. 60/176,774, filed on Jan. 19, 2000. This application Aug. 30, 2000, Appl. No. 650,921.
Int. Cl. F15B *15/22*
U.S. Cl. 92—9 **6 Claims**



5. A pneumatic cylinder with internal hydraulic dampening means, comprising:

a pneumatic cylinder barrel having a head on one end thereof and a cap on the opposite end thereof forming an internal pneumatic chamber, the head having a first passage means for passing air into and out of said pneumatic chamber, and the cap having a second passage means for passing air into and out of said pneumatic chamber;

a pneumatic piston mounted in the pneumatic chamber so as to be axially movable in a stroke in a first direction toward said cap and in the opposite direction toward said head, in response to air passing into said pneumatic chamber, and means connected to the piston for receiving an impact force;

the pneumatic piston having a first cushioning structure facing the head, and a second cushioning structure facing the cap;

a first shock piston slidably moveable in the pneumatic chamber and engageable with the first cushioning structure to form a first cushioning chamber;

a second shock piston slidably movable in the pneumatic chamber and engageable with the second cushioning structure to form a second cushioning chamber;

the pneumatic piston having a hydraulic metering passage connecting the first cushioning chamber and the second cushioning chamber;

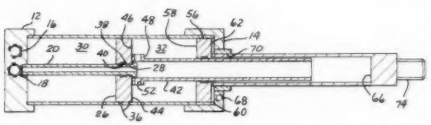
a charge of a hydraulic fluid disposed in the first cushioning chamber, the second cushioning chamber and the metering passage such that as the pneumatic piston is moved in at least one of said directions, one of said shock pistons urges the hydraulic fluid from the first cushioning chamber through the metering passage toward the second cushioning chamber, the metering passage being so sized as to exert a resistance to the passage of the hydraulic fluid therethrough, thereby cushioning a motion of the pneumatic piston in response to an impact force; and

said metering passage comprising the pneumatic piston having a first orifice and a second orifice, and at least one of the shock pistons having a first pin of a first length aligned with the first orifice and a second pin of a second, lesser length aligned with the second orifice, the first pin being receivable in the first orifice to restrict fluid passage through the metering passage, and the second pin being receivable in the second orifice to provide a further flow restriction through the metering passage at a different location of the pneumatic piston along a stroke.

US 6,408,740 B1
THREE POSITION CYLINDER

Douglas J. Holt, Livonia, and Robert C. Adams, Jr., Romeo, both of Mich., assignors to Welker Bearing Company, Troy, Mich.

Filed Dec. 4, 2000, Appl. No. 729,475
Int. Cl. F15B *15/24;* **F01B** *7/20*
U.S. Cl. 92—13.1 **15 Claims**



1. A three position cylinder assembly for movement between a fully retracted position, a midposition and a fully extended position, said cylinder assembly comprising of:

an outer cylinder connected between two bases, the first base defining a cap end and the second base defining a head end;

a first piston connect to a first rod;

a second piston connected to a second rod, wherein said first and second pistons are disposed and have reciprocal movement within the outer cylinder, said first and second rods extendable beyond the head end; and

a stop means disposed in the outer cylinder for the first piston, wherein said stop means is spaced from said cap end and said head end.

US 6,408,741 B1
HYDRAULIC CONTROL DEVICE FOR MOTOR VEHICLE CLUTCH

Pasquale Angione, Paris, France, assignor to Valeo, Paris, France

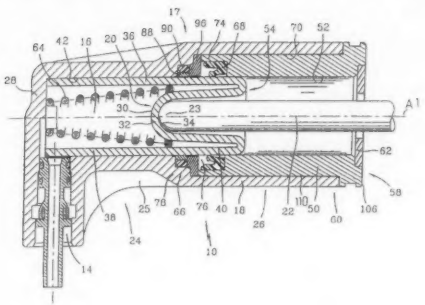
PCT No. PCT/FR00/00480, § 371 Date Jan. 11, 2001, § 102(e) Date Jan. 11, 2001, PCT Pub. No. WO00/50280, PCT Pub. Date Aug. 31, 2000

PCT Filed Feb. 25, 2000, Appl. No. 673,976

Claims priority, application France, Feb. 26, 1999, 99 02428

Int. Cl. F16J *10/00*

U.S. Cl. 92—165 R **13 Claims**



1. Apparatus for the hydraulic control of one of a brake and a clutch in a motor vehicle, comprising at least one control cylinder (**10**), wherein the cylinder (**10**) comprises a substantially tubular cylinder body (**17**) in which there slides axially a piston (**20**) which delimits, through a front transverse face (**30**), a cylindrical hydraulic chamber (**16**), of the type in which a port (**14**) for connection of a duct (**12**) is open into the hydraulic chamber (**16**), in which the cylinder body (**17**) is made in at least two parts of synthetic material, which parts comprise a main body (**18**) and a rear guide tube (**50**) which is fixed by welding to a rear part (**26**, **181**) of the main body (**18**), and which participates in the guiding of the piston (**20**) in the cylinder (**10**), and in which at least one dynamic sealing member is interposed between the piston (**20**) and the rear tube (**50**) so as to seal the hydraulic chamber (**16**), wherein the welding of the rear tube (**50**) to the main body (**18**) is carried out locally by indirect application of heat with the aid of at least one laser energy source while the rear tube (**50**) and the main body (**18**) are prestressed.

11. Apparatus for the hydraulic control of one of a brake and a clutch in a motor vehicle, comprising at least one control cylinder (**10**), wherein the cylinder (**10**) comprises a substantially tubular cylinder body (**17**) in which there slides axially a piston (**20**) which delimits, through a front transverse face (**30**), a cylindrical hydraulic chamber (**16**), of the type in which a port (**14**) for connection of a duct (**12**) is open into the hydraulic chamber (**16**), in which the cylinder body (**17**) is made in at least two parts of synthetic material such as plastics material, which parts comprise a main body (**18**) and a rear guide tube (**50**) which is fixed by welding to a rear part (**26**, **181**) of the main body (**18**), and which participates in the guiding of the piston (**20**) in the cylinder (**10**), and in which at least one dynamic sealing member is interposed between the piston (**20**) and the rear tube (**50**) so as to seal the hydraulic chamber (**16**), wherein the welding of the rear tube (**50**) to the main body (**18**) is carried out locally by indirect application of heat with the aid of at least one energy source of the laser type,

wherein the radiation, in the form of a beam emitted by the laser, is in the infrared radiation range, and wherein one of the elements consisting of the rear tube (**50**) and the main body (**18**) is of material transparent to infrared radiation, while the other element is so configured as to absorb the said radiation.

US 6,408,742 B1
SPIT ROD ASSEMBLY FOR ROTISSERIE OVEN

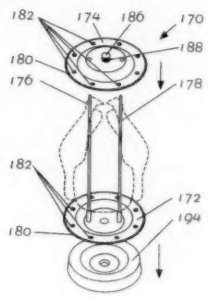
Alan L. Backus, 1660 Bel Air Rd., Los Angeles, Calif. 90077, and Ron Popeil, 1292 Monte Ceilo Dr., Beverly Hills, Calif. 90210

Continuation of application No. 09/662,308, filed on Sep. 15, 2000, which is a continuation of application No. 09/436,614, filed on Nov. 9, 1999, now Pat. No. 6,173,645, which is a continuation of application No. 09/217,944, filed on Dec. 21, 1998, now Pat. No. 6,170,390. This application Jun. 27, 2001, Appl. No. 893,076.

This patent is subject to a terminal disclaimer.

Int. Cl. A47J *37/04*

U.S. Cl. 99—421 H **24 Claims**



1. A spit rod assembly, comprising:

a first plate-shaped member;

a second plate-shaped member;

a first spit rod rigidly connected to the first plate-shaped member and coupled to the second plate-shaped member;

a second spit rod rigidly connected to the first plate-shaped member and coupled to the second plate-shaped member;

a first support axle extending from the center of the first plate-shaped member; and,

a second support axle extending from the center of the second plate-shaped member.

US 6,408,743 B2
CURVED-SURFACE PRINTING METHOD APPLICABLE TO MEMBER EXPOSED TO HIGH-TEMPERATURE CLOSED ATMOSPHERE AND LAMP UNIT HAVING SAME APPLIED THERETO

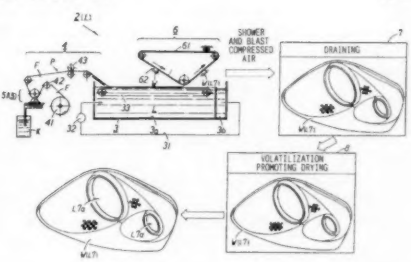
Takeshi Niwa; Midori Ishikawa, and Koichi Nakamura, all of Shizuoka, Japan, assignors to Cubic Co., Ltd., Shimizu, Japan, and Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1998, Appl. No. 215,148

Claims priority, application Japan, Dec. 18, 1997, 9-364628

Int. Cl. B41F *17/00*

U.S. Cl. 101—35 **14 Claims**



1. A curved-surface printing method applicable to a member that will be exposed to a high-temperature closed atmosphere, the method comprising:

floating a transfer film on water in a water tank, said transfer film being formed by coating a transfer ink on a water-soluble film;

downwardly pressing an object against the transfer film to print the transfer ink on a surface of the object by water pressure;

applying an activator which contains a plasticizer ingredient selected from the group consisting of dimethyl phthalate (DMP) and diethyl phthalate (DEP) onto the transfer film, to thereby provide the transfer ink on the transfer film with a stickiness sufficient to ensure transfer of the transfer ink to the object; and

carrying out a volatilization promoting drying treatment in order to substantially volatilize the plasticizer ingredient after the transfer ink has been transferred to the object, wherein the plasticizer ingredient remains on the object after the transfer ink has been transferred to the object.

US 6,408,744 B1

COMPACT INK-JET FRANKING MACHINE WITH MANUAL INSERTION

Franck Viennet, Paris, and Jean-Louis Potey, Courbevoie, both of France, assignors to Secap, France

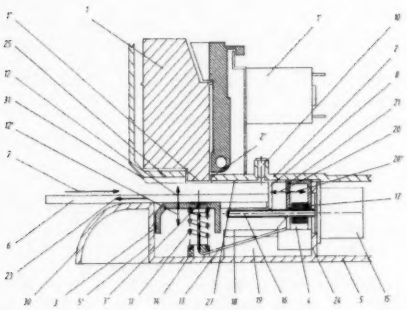
PCT No. PCT/FR99/02028, § 371 Date Jun. 21, 2000, § 102(e) Date Jun. 21, 2000, PCT Pub. No. WO00/16268, PCT Pub. Date Mar. 23, 2000

PCT Filed Aug. 23, 1999, Appl. No. 530,142

Claims priority, application France, Sep. 14, 1998, 98 11425

Int. Cl. B41L *47/46*

U.S. Cl. 101—91 **10 Claims**



1. A machine for postage metering a flat object comprising:

a drive mechanism;

a frame having a horizontal opening for inserting an object in a longitudinal direction, the frame also having two stops situated at right angles to the longitudinal direction, a fixed upper ceiling having a window, and a lower plate vertically moveable by the drive mechanism;

a device for holding the object by gripping the object between the upper ceiling and the lower plate;

an ink jet printing device having nozzles disposed inside the window of the ceiling;

a sensor for detecting presence of the object in vicinity of a corner of the stops;

an electronic control device, responsive to the sensor, for starting the drive mechanism to move the plate for gripping the object and for starting a print cycle; and

a device for moving the object in a direction transverse to the longitudinal direction and while the object is being gripped, in front of the printing device.

US 6,408,745 B1

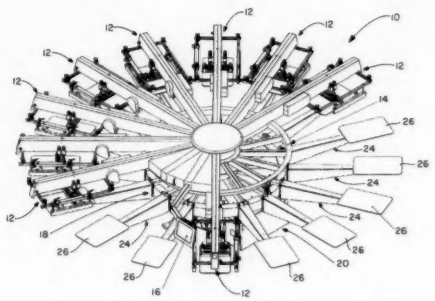
VARIABLE HEIGHT PRINT TABLE ARRANGEMENT FOR A SCREEN PRINTING APPARATUS

Anatol Topolewski, Mundelein; Mark Smialek, Bartlett, and Eugene Wesolowski, Mundelein, all of Ill., assignors to Anatol Incorporated, Mundelein, Ill.

Filed Jan. 6, 2000, Appl. No. 478,755

Int. Cl. B05C *17/06*

U.S. Cl. 101—126 **5 Claims**



1. A screen printing apparatus, comprising:

plurality of outwardly extending upper level stationary arms;

a plurality of outwardly extending lower level rotatable spider arms positioned below and corresponding to the plurality of stationary arms;

a means for positioning the plurality of spider arms a predetermined vertical distance in relation to the plurality of stationary arms, the means for positioning comprising a single ball screw mechanism operatively connected to the plurality of spider arms; and an electrical motor drivingly engaging the ball screw mechanism; and

a counterbalance mechanism to at least partially offset the weight of the plurality of spider arms, the counterbalance mechanism including an axially extending compression spring, wherein the compression spring is coaxial with an axis of rotation of the ball screw mechanism.

US 6,408,746 B1

PRINTING UNIT

Kurt Johannes Weschenfelder, Zell/Main, Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

PCT No. PCT/DE99/02261, § 371 Date Jan. 24, 2001, § 102(e) Date Jan. 24, 2001, PCT Pub. No. WO00/06382, PCT Pub. Date Feb. 10, 2000

PCT Filed Jul. 23, 1999, Appl. No. 744,234

Claims priority, application Germany, Jul. 24, 1998, 198 33 470

Int. Cl. B41F *7/02;7/10*

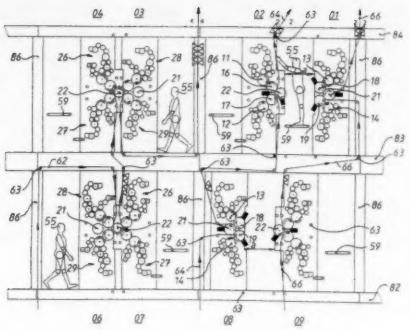
U.S. Cl. 101—142 **13 Claims**

1. A printing unit of an offset printing press comprising:

at least four forme cylinders;

and at least four transfer cylinders; and

at least first and second counter-pressure cylinders; said printing unit being selectively operable in a first type of production in which said at least four transfer cylinders are placed against a common one of said first and second counter-pressure cylinders and in a second type of production in which at least first and second of said at least four transfer cylinders are arranged to work with one of said at least first and second counter-pressure cylinders and at least a third of said at least four



transfer cylinders is arranged to work with another of said at least first and second counter-pressure cylinders.

US 6,408,747 B2

OFFSET PRINTING UNIT

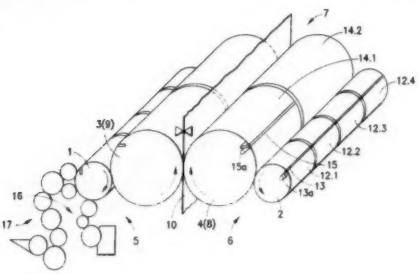
Günter Koppelkamm, Neuensalz; Ralf Schädlich, and Johannes Behmel, both of Plauen, all of Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach am Main, Germany

Filed Feb. 1, 1999, Appl. No. 241,884

Claims priority, application Germany, Jan. 31, 1998, 198 03 809

Int. Cl. B41L *23/00*

U.S. Cl. 101—147 **15 Claims**



1. A roll-fed rotary offset printing machine, comprising:

a printing unit having an impression cylinder and at least one cylinder pair including a form cylinder and a transfer cylinder operatively arranged so that ink is applicable from the transfer cylinder to a printing material web guidable along a vertical path between the transfer cylinder and the impression cylinder;

the form cylinder having an outer surface with a circumferential length and a longitudinal length configured such that a first print page array is independently fittable within the outer surface of the form cylinder, the first print page array being in a broadsheet format and comprising only one broadsheet page fittable in the circumferential length of the form cylinder and at least four broadsheet pages fittable in the longitudinal length of the form cylinder, wherein the circumferential length of said form cylinder is sized for receiving only one height of said broadsheet page; and

said form cylinder further comprising means for receiving at least one flexible printing plate having a height and a length, wherein the circumferential length of said form cylinder is sized for receiving only one height of said at least one flexible printing plate and the longitudinal length of said form cylinder is sized for receiving at least one width of said at least one flexible printing plate, wherein said first print page array is arrangeable on said at least one flexible printing plate; and

wherein a circumferential length of said transfer cylinder is larger than the circumferential length of said form cylinder by an integral multiple and a longitudinal length of said transfer cylinder spans at least the longitudinal length of said at least one flexible printing plate.

US 6,408,748 B1

OFFSET PRINTING MACHINE WITH INDEPENDENT ELECTRIC MOTORS

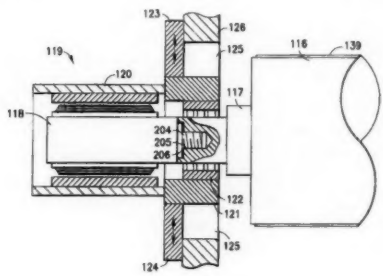
Josef Hajek, Friedberg; Johann Königer, Augsburg; Michael Schramm, Ainding, and Peter Gröbner, Augsburg, all of Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach am Main, Germany

Filed Feb. 9, 1995, Appl. No. 386,371

Claims priority, application Germany, Aug. 30, 1994, 44 30 693

Int. Cl. B41F *5/16*

U.S. Cl. 101—177 **18 Claims**



1. A web-fed offset printing machine comprising

a plurality of printing units, each said printing unit comprising at least one form cylinder and at least one transfer cylinder, each said cylinder comprising a cylinder body having opposed end faces, and a pair of journals having flanges screwed to respective said end faces, and

at least one electric motor in drive connection with a respective at least one of said cylinders in each of said printing units, each said at least one of said cylinders not being in mechanical drive connection with any other cylinder in said printing unit which is driven by another electric motor, each said electric motor comprising a rotor which is rigidly connected to one of said journals.

US 6,408,749 B1

GEAR TRANSMISSION FOR DRIVING A PRINTING PRESS

Frank Schaum, Neckargemünd, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Oct. 27, 1999, Appl. No. 428,182

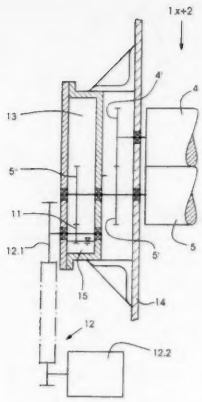
Claims priority, application Germany, Oct. 27, 1998, 198 49 382

Int. Cl. B41F *13/00*; **F16H** *57/04*

U.S. Cl. 101—212 **5 Claims**

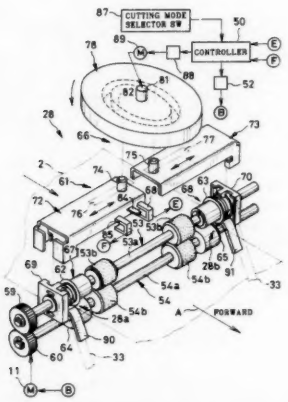
1. A gear transmission for driving a printing press, comprising:

a plurality of gear pairs formed of mutually meshing gearwheels disposed operationally in a power-flow, at least one of said gear pairs being more heavily loaded than a rest thereof during operation; and



a case encapsulating said gearwheels forming said at least one, more heavily loaded gear pair and the rest of the gear pairs being disposed outside said case.

US 6,408,750 B1
PRINTER CAPABLE OF CUTTING MARGINS
Satoru Goto, and Akimasa Kaya, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jun. 23, 2000, Appl. No. 602,891
Claims priority, application Japan, Jun. 23, 1999, 11-176310; Jul. 16, 1999, 11-203833; Jul. 19, 1999, 11-204557
Int. Cl. B26D *5/02*
U.S. Cl. 101—226 **21 Claims**



1. A printer for image printing to a recording material in a region surrounded by front and rear margins and first and second side margins, said front and rear margins extending in a main scan direction, said first and second side margins extending in a sub scan direction, said printer comprising:

cutter means for removing at least one of said front and rear margins from said recording material by cutting along a line extending in said main scan direction;

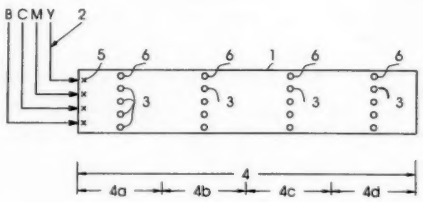
slitter means for removing at least one of said first and second side margins from said recording material by slitting along a line extending in said sub scan direction;

a slitter shifter for shifting said slitter means in said main scan direction to one of a slitting position and a home position, said slitter means being set in a path of said recording material to cut away said at least one side margin when in said slitting position, and being set away from said path of said recording material when in said home position;

an externally operable mode selector for selectively setting a marginless mode and a margin mode; and

a controller for causing said slitter shifter to set said slitter means to said slitting position when said marginless mode is set, and for causing slitting of said slitter means and cutting of said cutter means, said controller causing said slitter shifter to set said slitter means to said home position when said margin mode is set, and inhibiting slitting of said slitter means and cutting of said cutter means.

US 6,408,751 B1
MULTI-COLOR, MULTI-PROCESS AUTOMATIC INK LEVELER
Peter Walczak, Lee, N.H., assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany
Filed Apr. 26, 2000, Appl. No. 559,220
Int. Cl. B41F *31/02*
U.S. Cl. 101—365 **9 Claims**



1. An ink leveler for an open fountain printing press, comprising:

an ink leveler bar formed with a plurality of chambers;

a plurality of ink supply lines each issuing into a respective one of said ink chambers via a respective inflow valve for supplying mutually different inks to said ink chambers;

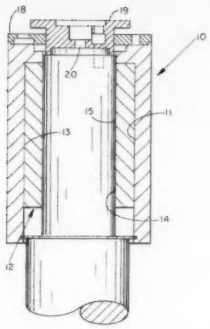
a plurality of remote-controlled outflow valves communicating with said ink chambers for outputting therefrom ink to an ink fountain of a printing press.

US 6,408,752 B1
MOUNTING PRINTING PLATE CYLINDER TO ROTATABLE DRIVE SHAFT
David A. McEachern, St. Paul, and Robert A. Heitman, St. Paul Park, both of Minn., assignors to T.W. Wright, Inc., St. Paul, Minn.
Filed Jan. 10, 2000, Appl. No. 480,128
Int. Cl. B41F *13/10*
U.S. Cl. 101—375 **4 Claims**

1. Apparatus for mounting a printing plate onto a rotatable untapered cylindrical printing press drive shaft, comprising:

a printing plate cylinder having an axial bore and an outer surface for mounting a printing plate;

a sleeve comprising a linear bearing having an inner bearing surface for engaging a rotatable untapered cylindrical drive shaft for adjustable coupling said sleeve to the drive shaft, said sleeve having an outer untapered cylindrical surface press-fitted into the axial bore of said printing plate cylinder; and



means at one end of said printing plate cylinder for adjustably attaching said cylinder to the drive shaft.

US 6,408,753 B1

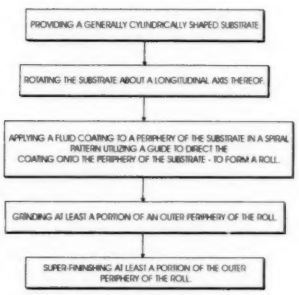
FLOW COATING PROCESS FOR MANUFACTURE OF POLYMERIC PRINTER AND BELT COMPONENTS

Patrick J. Finn; Anthony J. Formicola, both of Webster; Joseph R. Blaszak; Robert M. Ferguson, both of Penfield, and Laurence J. Lynd, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 26, 1996, Appl. No. 672,493

Int. Cl. B41N *11/00;* **B05D** *1/02;1/36;3/00*

U.S. Cl. 101—401.1 **28 Claims**


PROVIDING A GENERALLY CYLINDRICALLY SHAPED SUBSTRATE
ROTATING THE SUBSTRATE ABOUT A LONGITUDINAL AXIS THEREOF
APPLYING A FLUID COATING TO A PERIPHERY OF THE SUBSTRATE IN A SPIRAL PATTERN UTILIZING A GUIDE TO DIRECT THE COATING ONTO THE PERIPHERY OF THE SUBSTRATE - TO FORM A ROLL
GRINDING AT LEAST A PORTION OF AN OUTER PERIPHERY OF THE ROLL
SUPER-FINISHING AT LEAST A PORTION OF THE OUTER PERIPHERY OF THE ROLL

1. A method for manufacturing a polymeric printing member for use in a printing machine, said method comprising the steps of:

providing a generally cylindrically shaped substrate;

rotating the substrate about a longitudinal axis thereof in a substantially horizontal direction; and

applying a coating from an applicator in a stream in a generally vertically downward direction to an outer periphery of the substrate, said stream contacting the outer periphery of the substrate at a position substantially above a horizontal centerline of the substrate and contacting the outer periphery of the substrate at a position spaced from an uppermost location of the substrate in the direction of the rotation of the substrate, whereby the dynamics of the rotation of the substrate and the position of the stream on the substrate assist in the uniform distribution of the coating onto the substrate.

US 6,408,754 B2

FLEXOGRAPHIC PRINTING APPARATUS

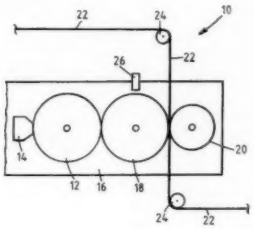
Steven J. Siler, 363 Margaret Terr., Cary, Ill. 60013, and David M. Klein, 464 Forest Dr., Fontana, Wis. 53125

Continuation of application No. 09/310,259, filed on May 12, 1999, now Pat. No. 6,314,879. This application Mar. 23, 2001, Appl. No. 816,059.

This patent is subject to a terminal disclaimer.

Int. Cl. B41N *6/00;* **B41F** *9/00;* **B41M** *1/10*

U.S. Cl. 101—401.1 **4 Claims**



1. A flexographic printing apparatus for printing a moving web, said printing apparatus comprising:

a rotatable ink roller;

a roller support that rotatably supports said ink roller;

an ink source associated with said ink roller, said ink source providing ink to be applied to said ink roller;

a rotatable printing roller associated with said ink roller;

a printing plate disposed on said printing roller, said printing plate being supported so that ink is transferred from said ink roller to said printing plate as said ink roller and said printing roller rotate, said printing plate comprising:

a semi-conductive printing layer having an image-forming surface, said semi-conductive printing layer comprising a photo-sensitive polymer material; and

a substrate layer on which said semi-conductive printing layer is formed, said substrate layer comprising an insulating material having a resistivity of greater than about two megohms per cubic centimeter,

said semi-conductive printing layer comprising a plurality of portions of semi-conductive material formed on said substrate layer, said portions of said semi-conductive material being spaced apart and formed so that portions of said substrate layer are not covered by said portions of said semi-conductive material;

an insulating layer disposed on said printing roller, said insulating layer being disposed between an outer surface of said printing roller and said printing plate;

a rotatable backing roller disposed adjacent said printing roller so that said moving web to which ink is to be applied passes between said backing roller and said printing plate as said backing roller and said printing roller rotate so that a printed image is applied to said web; and

a charge applicator associated with said printing roller, said charge applicator causing an electric charge to be applied to said printing plate, said charge applicator comprising an elongate charge bar having a plurality of charging electrodes spaced from said printing plate, said charging electrodes being evenly spaced from each other in a direction parallel to a central axis of said printing roller, each of said charging electrodes being conductively connected to a voltage.

US 6,408,755 B1

METHOD FOR ERASING A LITHOGRAPHIC PRINTING MASTER

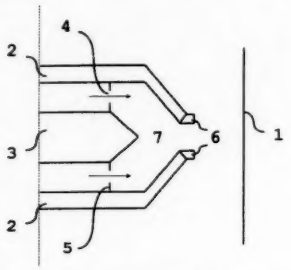
Augustin Meisters, Gentbrugge; Joan Vermeersch, Deinze; Luc Leenders, Herentals, and Bavo Muys, Eppegem, all of Belgium, assignors to Agfa-Gavaert, Mortsel, Belgium

Provisional application No. 60/155,769, filed on Sep. 27, 1999. This application Aug. 15, 2000, Appl. No. 638,877.

Claims priority, application European Pat. Off., Aug. 31, 1999, 99202799

Int. Cl. B41M *1/06;* **B41C** *1/10*

U.S. Cl. 101—478 **7 Claims**



1. A method of lithographic printing with a printing press comprising:

(i) making an imaging material by providing a support with an image recording layer, said imaging material comprising one or more layers containing a light absorbing compound in an amount not less than 50% by weight relative to all the layers of said imaging material, excluding the support;

(ii) making a printing master having a printing surface comprising ink accepting areas by image-wise exposing and optionally developing the imaging material;

(iii) starting a pressrun; and

(iv) removing said ink accepting areas of said printing surface by treating said printing surface (1) with a plasma that is capable of operating at one atmosphere of pressure or (2) by directing an atmospheric plasma jet to said printing surface and scanwise moving said plasma jet relative to said printing surface.

US 6,408,756 B1

PRINTING UNIT WITH PRINTING CYLINDER HAVING SIMPLIFIED REMOVAL AND LOCKING

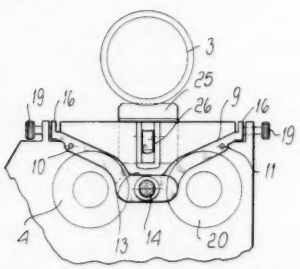
Federico D'Annunzio, Cislago, and Giacomo Maccalli, Lodi, both of Italy, assignors to Gi Due S.r.l., Cislago, Italy

Filed Sep. 26, 2000, Appl. No. 670,989

Claims priority, application European Pat. Off., Oct. 11, 1999, 99830639

Int. Cl. B41F *13/44*

U.S. Cl. 101—479 **9 Claims**



1. A printing unit with a removable printing cylinder, comprising two outer shoulders which are adapted to constitute a supporting frame for the printing cylinder, a first pair of arms and a second pair of arms which are pivoted around a pivoting point at an upper end of each one of said shoulders and form a seat for accommodating said printing cylinder, means for locking said printing cylinder being provided in order to retain said printing cylinder so that said printing cylinder rests on said first and second pairs of arms.

US 6,408,757 B2

PAPER ROLL BRAKING DEVICE

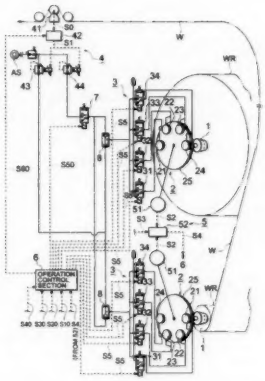
Yukio Ogawa, Chgasaki; Nobuaki Hashimoto, Hachiouji; Takanobu Sakakura, Inagi, and Atushi Satoh, Kawasaki, all of Japan, assignors to Tokyo Kikai Seisakusho, Ltd., Japan

Filed Dec. 21, 2000, Appl. No. 751,921

Claims priority, application Japan, Dec. 22, 1999, 11-364102

Int. Cl. B41F *13/016*

U.S. Cl. 101—480 **15 Claims**



1. A paper roll braking device for rotary presses, in which a web is paid off from a paper roll supported between frames, caused to travel and printed in a printing unit, comprising:

braking sections provided at a plurality of locations along the outer periphery of a rotor provided on a supporting member for supporting the paper roll and equipped with friction discs that can be engaged with and disengaged from the rotor at each location,

engage/disengage changeover sections for controlling the engaging/disengaging operation of the friction discs with respect to the rotor,

a contact pressure adjusting section having a tension sensing mechanism for sensing a change in the traveling tension of the web and adjusting the contact pressure of the friction discs with the rotor via the engage/disengage changeover section in accordance with the change in the traveling tension of the web detected by the tension sensing mechanism,

an outside diameter detecting section for detecting the outside diameter of the paper roll, and

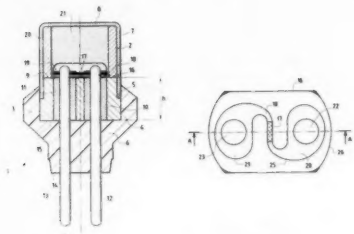
an operation control section for at least changing over the engage/disengage changeover section when the outside diameter of the paper roll detected by the outside diameter detecting section reaches a predetermined diameter.

US 6,408,758 B1

PHOTOETCHED-FILAMENT PYROTECHNIC INITIATOR PROTECTED AGAINST ELECTROSTATIC DISCHARGES

Jean-René Duguet, Survilliers, France, assignor to Livbag SNC, Rue Lavoisier, France

Filed Oct. 25, 2000, Appl. No. 695,275
Claims priority, application France, Nov. 5, 1999, 99 13849
Int. Cl. F42C *19/08*
U.S. Cl. 102—202.2 **7 Claims**



1. Electropyrotechnic initiator (**1**) protected against electrostatic discharges, comprising: inside a fragmentable container (**2**) closed and supported by an overmoulding (**6**), an initiation head consisting of an impermeable wall formed by a solid body (**3**) of height h which has a plane upper face (**9**) and which grips, over its entire height h, a glassy structure (**10**, **11**) penetrated by two electrodes (**12**, **13**) in the form of pins, said electrodes each having one end which protrudes from said plane upper face, this protrusion allowing them to be electrically connected to an electrical thick-film multifoil circuit (**18**) supported by an insulating support (**16**) which rests on said plane upper face and is itself penetrated by said electrodes, said circuit having a flat resistive heating element (**17**) connected to said electrodes via two separate conducting metal areas (**28**, **29**) lying on said support, each area being in contact with one of the two electrodes, said flat element and said metal areas being covered with a pyrotechnic initiating composition (**19**), characterized in that: said thick-film multifoil circuit (**18**) has the overall shape of an "S" and comprises a first film consisting of a first foil (**24**) made of a resistive metal alloy, having a thickness of between 2×10^{-6} m and 7×10^{-6} m, adhesively bonded to said support and penetrated by said electrodes, said first foil having a shape which has, between the electrodes, a central part forming the flat resistive element (**17**) and the external outline (**25**) of which first foil, except for said central part, consists of curved lines whose radii of curvature are greater than 7×10^{-4} m, said first foil being covered, except for said central part, with a second, conducting, metal film (**27**) serving to form the metal areas (**28**, **29**) which are penetrated by said electrodes and which have a shape and thickness which are similar to those of the parts of the first foil that they cover.

US 6,408,759 B1

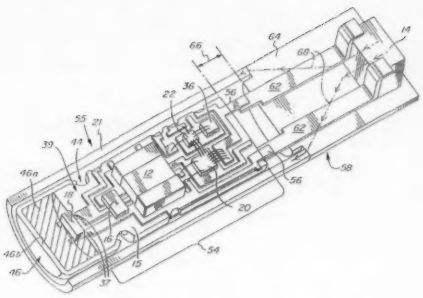
INITIATOR WITH LOOSELY PACKED IGNITION CHARGE AND METHOD OF ASSEMBLY

David W. Ewick, North Granby, and Brendan M. Walsh, Simsbury, both of Conn., assignors to The Ensign-Bickford Company, Simsbury, Conn.

PCT No. PCT/US98/06146, § 371 Date Feb. 29, 2000, § 102(e) Date Feb. 29, 2000, PCT Pub. No. WO98/45663, PCT Pub. Date Oct. 15, 1998
Continuation-in-part of application No. 08/831,664, filed on Apr. 9, 1997, now Pat. No. 5,889,228. This PCT application Mar. 31, 1998, Appl. No. 402,868.
This patent is subject to a terminal disclaimer.
Int. Cl. F42B *3/10*; **C06C** *5/00*
U.S. Cl. 102—202.5 **39 Claims**

1. A detonator comprising:

a housing;



a low-energy electronic initiation means in the housing;

an ignition charge disposed in the housing in direct initiation relation to the initiation means, the ignition charge comprising BNCP in pulverulent form comprising particles having an average size less than 10 μm and having a density of less than 65.9 percent of its theoretical maximum density (TMD), for producing a deflagration signal in the housing in response to a low-energy initiation signal from the initiation means; and

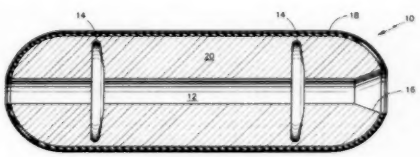
an output charge in the housing for producing a detonation output signal in response to the deflagration signal of the ignition charge.

US 6,408,760 B1

METHOD OF MANUFACTURING SOLID ROCKET MOTORS

Donald Lee Knaresboro, and Forrest Ray Goodson, both of San Jose, Calif., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 18, 1997, Appl. No. 993,811
Int. Cl. C06B *45/00*
U.S. Cl. 102—288 **4 Claims**



1. A method for forming solid rocket propellant motors, comprising:

providing a mandrel having an easily disintegrative solid slot former positioned thereon;

casting uncured solid rocket propellant about said mandrel and said easily disintegrative solid slot former;

curing said solid rocket propellant;

removing said mandrel from said solid rocket propellant; and

mechanically removing said easily disintegrative solid slot former from said solid rocket propellant by scraping or other equivalent mechanical process.

US 6,408,761 B1

BLASTING APPARATUS

Hiroaki Arai; Hidehiko Maehata; Hajime Yoshii; Toshiaki Enomoto, and Taisuke Ishihara, all of Osaka, Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

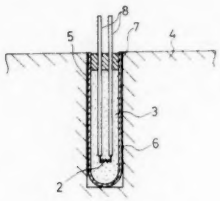
PCT No. PCT/JP98/01091, § 371 Date Sep. 9, 1999, § 102(e) Date Sep. 9, 1999, PCT Pub. No. WO98/43039, PCT Pub. Date Oct. 1, 1998

PCT Filed Mar. 13, 1998, Appl. No. 392,939

Claims priority, application Japan, Mar. 26, 1997, 9-72529; Oct. 27, 1997, 9-293076

Int. Cl. F42B *3/10*; F42C *19/12*

U.S. Cl. 102—302 1 Claim



1. A blasting apparatus in which a material selected from the group consisting of nitromethane and gasoline is filled in a blasting container, a melting/vaporization substance which is melted and vaporized rapidly when an electric energy of a predetermined amount is supplied thereto for a short time is provided in said material so that said melting/vaporization substance is exposed, an electric energy supply circuit for supplying said electric energy to said melting/vaporization substance is provided, and said material is capable of being exploded by a phenomenon caused in a process of melting and vaporization of said melting/vaporization substance so as to blast a to-be-blasted object by the explosive force.

US 6,408,762 B1

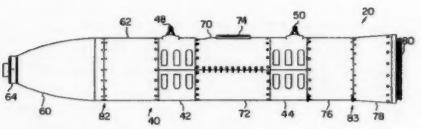
CLAMP ASSEMBLY FOR SHROUDED AERIAL BOMB

Bruce E. Schmacker, and Ronald L. Wooten, both of Orlando, Fla., assignors to Lockheed Martin Corporation, Bethesda, Md.

Continuation of application No. PCT/US97/23112, filed on Dec. 11, 1997. This application May 25, 2000, Appl. No. 555,119.

Int. Cl. F42B *10/00*

U.S. Cl. 102—382 18 Claims



1. A shrouded aerial bomb, comprising:

a penetrating body having a nose section shaped with an ogive and having a hollow bore with an opening at a tail end and extending toward the nose section; and

an aerodynamic shroud mounted to an outer surface of the penetrating body, the shroud having an outer surface and including at least one clamp mounted to a center potion of the penetrating body, wherein the at least one clamp includes a forward clamp and an aft clamp mounted in longitudinally spaced relationship, each clamp including two semi-cylindrical parts fastened together to encircle the penetrating body, said forward clamp and said aft clamp forming a portion of said outer surface of said shroud,

wherein an aerodynamic shape of the shroud is substantially identical to an aerodynamic shape of a selected, qualified aerial bomb and the penetrating body and shroud have a weight, center of gravity, and moments of inertia substantially similar to a weight, center of gravity, and moments of inertia of said selected, qualified aerial bomb.

US 6,408,763 B1

APPARATUS FOR LAND, SEA, AND AIR DEFENSE

Tero Hurtta, Helsinki; Juhani Niinivaara, and Tarmo Niinivaara, both of Koria, all of Finland, assignors to Sea Valve Engineering Oy, Helsinki, Finland

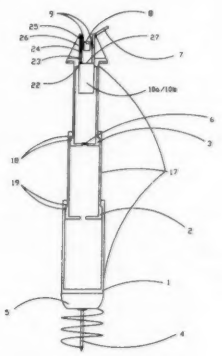
PCT No. PCT/FI00/00175, § 371 Date Nov. 27, 2000, § 102(e) Date Nov. 27, 2000, PCT Pub. No. WO00/63633, PCT Pub. Date Oct. 26, 2000

PCT Filed Mar. 7, 2000, Appl. No. 701,172

Claims priority, application Finland, Apr. 20, 1999, 990887

Int. Cl. F42B *23/00*

U.S. Cl. 102—404 20 Claims



1. A defense apparatus, comprising:

a telescopic cylinder mast comprised of at least an inner cylinder nested in an outer cylinder,

the inner and outer cylinders being movable relative to each other between a shortened state and an elongated state,

in the shortened state, the inner cylinder being pre-pressurized with pressurized gas;

a remotely-controlled pressure releasing apparatus connected to the inner cylinder for releasing the pressurized gas from the inner cylinder and passing the pressurized gas to the outer cylinder for elongating the telescopic cylinder mast from the shortened state to the elongated state; and

a defense system fitted to a first end of the inner cylinder.

US 6,408,764 B1

CASE BASE FOR LARGE-CALIBER AMMUNITION

Thomas Heitmann, Unterlüss, and Torsten Niemeyer, Celle, both of Germany, assignors to Rheinmetall W & M GmbH, Unterluess, Germany

Filed Sep. 18, 2000, Appl. No. 664,069

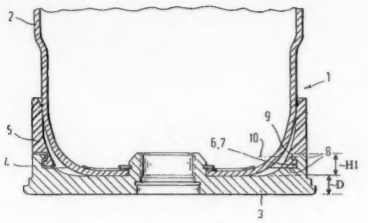
Claims priority, application Germany, Sep. 16, 1999, 199 44 375

Int. Cl. F42B *5/18*; *5/26*

U.S. Cl. 102—469 6 Claims

1. A case base for large-caliber ammunition having a case jacket comprising a combustible material, wherein:

the case base comprises a metallic base plate and a support ring that projects axially beyond the base plate at an edge of the base plate, and an obturation ring that is disposed on a projectile side of the support ring, is formed of an elastomer or a thermoplastic, and has a lower end extending into and facing an inner surface of the support ring;



the base plate and the support ring are embodied as a unitary structure;

the height H1 of the support ring projecting beyond the base plate has the following relationship: 0<H1<2D, where D represents the wall thickness of the base plate; and,

on its inner surface facing the obturation ring, the support ring has a groove-shaped undercut into which the end of the obturation ring facing the support ring extends, with at least one of a form-fit and a positive lockup.

US 6,408,765 B1

DOOR BREACHING DEVICE WITH SAFETY ADAPTER

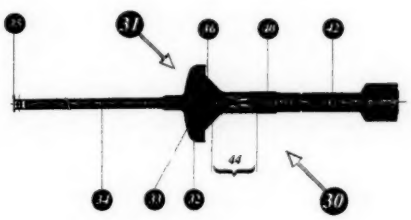
Zvi Tauber, Kiryat Motzkin, and Joseph Teper, Kiryat Bialik, both of Israel, assignors to State of Israel-Ministry of Defense Armament Development Authority-Rafael, Haifa, Israel

Filed Mar. 2, 1999, Appl. No. 260,034

Int. Cl. F42B *3/00;5/04;7/00*

U.S. Cl. 102—499 **16 Claims**

DOOR BLASTING RIFILE GRANADE



1. A breaching device for controlled blasting of an object at short range, the device comprising:

(a) a blasting element including an explosive charge contained within a housing, said blasting element being configured to blast the object from a preset distance;

(b) a stand-off rod connected to, and extending from, said housing, said stand-off rod having a length equal to said preset distance;

(c) a pyrotechnic lead pellet associated with said blasting element and with said stand-off rod so as to detonate said explosive charge substantially upon impact of said stand-off rod with the object; and

(d) a tail for stabilizing the device during its flight to the object, wherein said tail is connected to said blasting element through a safety connector, said safety connector being configured to reduce shock forces acting on said tail resulting from detonation of said explosive charge.

US 6,408,766 B1

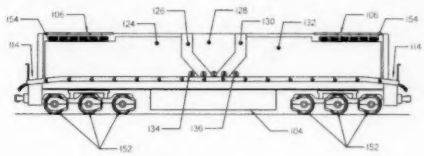
AUXILIARY DRIVE, FULL SERVICE LOCOMOTIVE TENDER

Edward M. McLaughlin, 975 E. Essex Ct. Way, #6, Midvale, Utah 84047; Michael D. Gordon, 3163 133rd Ave., Thornton, Colo. 80241, and Daniel L. Moore, 30373 Hilltop Dr., Evergreen, Colo. 80439

Filed Jun. 25, 1999, Appl. No. 344,262

Int. Cl. B61C *17/02*

U.S. Cl. 105—231 **15 Claims**



3. Where it is desired to increase the range and tractive force of a locomotive, having an electric power source, an auxiliary drive tender comprising:

(a) at least two trucks, each comprising at least two drive axles, driven by one or more traction motors;

(b) a structural frame, connected to and supported by said trucks;

(c) means, attached to at least one end of said frame, for physically coupling said auxiliary drive tender to the locomotive;

(d) means for electrically coupling said traction motors to the electric power source on the locomotive;

(e) fuel storage means attached to and supported by said frame; and

(f) fuel transfer means, coupled to said fuel storage means, and adapted to transfer fuel to the locomotive; and

(g) lubrication oil storage means, supported by said frame, and lubrication oil transfer means, coupled to said lubrication oil storage means, adapted to transfer lubrication oil to the locomotive.

US 6,408,767 B1

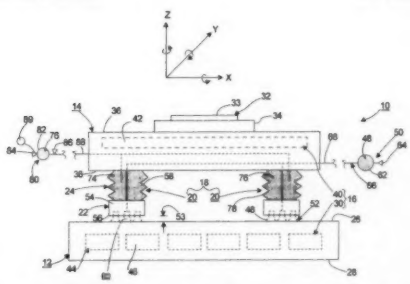
LOW STIFFNESS SUSPENSION FOR A STAGE

Mike Binnard, Belmont, and Douglas C. Watson, Campbell, both of Calif., assignors to Nikon Corporation, Japan

Filed Mar. 1, 2000, Appl. No. 516,492

Int. Cl. A47B *85/00*

U.S. Cl. 108—20 **57 Claims**

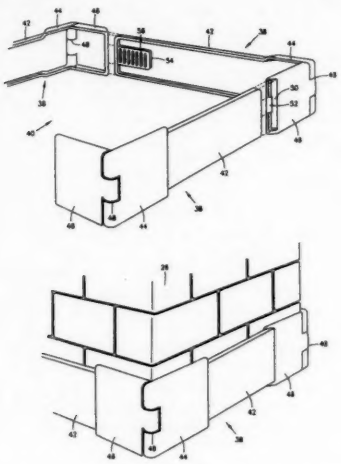


1. A suspension system adapted for use with a bearing fluid for suspending a stage spaced apart from a stage base, the suspension system comprising:

a suspension assembly including (i) a fluid pad adapted to be in fluid communication so that the bearing fluid can be directed from the fluid pad to maintain the fluid pad spaced apart from the stage base, and (ii) an adaptable section adapted to secure the fluid pad to the stage, the adaptable section being adapted to allow for relative movement between the fluid pad and the

stage, wherein the adaptable section includes a suspension member that has a characteristic controllable with no relation to the fluid.

US 6,408,768 B1
ADJUSTABLE PALLET GUARD
Paul Giampavolo, Somersworth, N.H., and Robert N. Shelton, Princeton, Mass., assignors to Safe Strap Company, Inc., N.H.
Provisional application No. 60/136,168, filed on May 27, 1999. This application Mar. 29, 2000, Appl. No. 537,326.
Int. Cl. A47B *17/00*
U.S. Cl. 108—27 **35 Claims**



1. A pallet guard for a pallet, the pallet guard including a plurality of pallet guard sections, the pallet guard sections being assembleable into the pallet guard and the assembled pallet guard comprising:

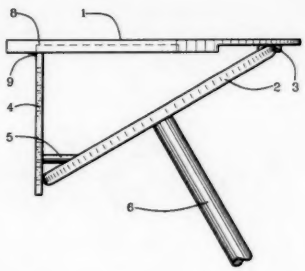
at least one insertion member; and

at least one receiving member coupled to said insertion member; wherein

one of said insertion member and said receiving member provides a plurality of adjustable positions for said insertion member with respect to said receiving member so as to allow a combined length of the insertion member and receiving member to be adjusted to a dimension of the pallet and any merchandise thereon whereby a respective insertion member and a respective receiving member are engageable in a plurality of positions thereby defining a plurality of areas for said pallet guard.

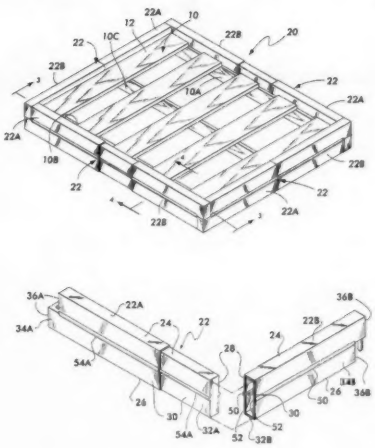
US 6,408,769 B1
STEERING WHEEL TABLE
Jane D. Lewis, 1460 Golden Gate Pkwy., PMB 519, Suite 103, Naples, Fla. 34105
Filed Feb. 5, 2001, Appl. No. 775,985
Int. Cl. A47B *37/00*
U.S. Cl. 108—44 **2 Claims**

1. In a steering-wheel table comprising a tabletop sized to fit over a steering wheel of a motor vehicle; a top set on a bottom-forward portion of the tabletop; the top seat fitting onto a top-forward portion of the steering wheel; two or more bottom seats on at least one support leg extended downward from proximate bottom-rearward portions of the steering wheel; the at least one support leg has a fixed length for a fixing distance of the rearward



portions of the steering wheel; the at least one support leg includes a single leg that is attached pivotally to an aft wall of a storage pocket into which the support leg is pivotal in the bottom-rearward portions of the tabletop in a storage mode; the support leg is pivotal downwardly from the aft wall for an installation mode; a first bottom seat on the support leg fits onto a first side of the bottom rearward portions of the steering wheel in the installation mode; and a second bottom seat on the support leg fits onto a second side of the bottom rearward portions of the steering wheel in the installation mode; the tabletop is round with a diametric length proximate a diametric length of an intended steering wheel; and an extension leg extended downward pivotally from a bottom of the table extension; the extension leg is pivotal and lockable in length and direction of extension; the extension leg is a ball-and-socket support having a lever-rod base on a bottom of the table extension and a support tip on a tip end.

US 6,408,770 B1
ADJUSTABLE PALLET PROTECTOR ASSEMBLY FOR A SINGLE PALLET OR AN ARRAY OF PALLETS
Allen Mason, Palm Beach, Fla., assignor to Food Machinery Equipment Corporation, Palm Beach, Fla.
Filed Mar. 15, 2001, Appl. No. 808,916
Int. Cl. B65D *19/44*
U.S. Cl. 108—54.1 **22 Claims**



1. An adjustable pallet protector assembly for use with at least one pallet, said pallet protector assembly comprising at least four elongated, similarly shaped guard members, each of said guard members comprising a first hollow section and a second hollow section, said first hollow section having an inner wall having a generally planar outer surface, a bottom wall having a generally

planar outer surface and a first end portion, said second hollow section having an inner wall having a generally planar outer surface, a bottom wall having a generally planar outer surface and a second end portion, said first and second sections being telescopically slidably coupled together, whereupon the length of said guard member can be adjusted, said first end portion of said first section including a first connector, said second end portion of said second section including a second connector, said connectors of said guard members being releasably securable to one another to form a self-supporting frame for encircling the periphery of the at least one pallet, with said inner walls of said guard members being disposed closely adjacent the at least one pallet, with said bottom walls of said guard members being arranged to be located on a support surface and with said guard members being resistant to accidental disconnection from each other.

US 6,408,771 B1

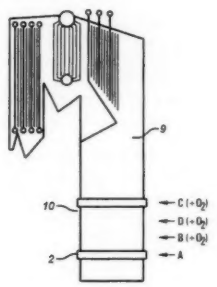
METHODS OF IMPROVING PRODUCTIVITY OF BLACK LIQUOR RECOVERY BOILERS

Louis C. Philippe, Versailles; Eric L. Duchateau, Gieres, both of France; David R. Scheeff, Marietta, Ga.; Arie Verloop, Kirkland, Wash., and Edward C. Dye, Bothell, Wash., assignors to Air Liquide America Corporation, Houston, Tex.; American Air Liquide, Fremont, Calif.; L'Air Liquide Societe Anonyme pour l'Etude et, l'Exploitation des Procedes Georges Claude, Paris, France, and Jansen Combustion and Boiler Technologies, Inc., Woodinville, Wash.

Continuation of application No. 08/937,290, filed on Sep. 26, 1997, now Pat. No. 5,992,337. This application Sep. 9, 1999, Appl. No. 392,418.

Int. Cl. F23G *7/04;7/06;* **D21C** *11/12*

U.S. Cl. 110—348 **6 Claims**



1. A method to increase the throughput of a recovery boiler equipped with at least primary and secondary levels of injection of air, the method comprising operating the recovery boiler with a third level of oxidant injection below or at the same level as the secondary level, and oxygen enrichment applied to at least the secondary level and said third level.

US 6,408,772 B1

IN-LINE SUB-SURFACE SEEDING, FERTILIZING AND WATERING SYSTEM

Noel D. Lempriere, Box 1178, Barriere, Canada, V0E 1E0

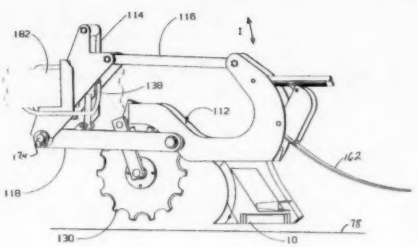
PCT No. PCT/CA00/00517, § 371 Date Nov. 5, 2001, § 102(e) Date Nov. 5, 2001, PCT Pub. No. WO00/67551, PCT Pub. Date Nov. 16, 2000

Provisional application No. 60/132,734, filed on May 6, 1999. This PCT application May 5, 2000, Appl. No. 959,682.

Int. Cl. A01C *7/00;7/06*

U.S. Cl. 111—123 **24 Claims**

1. An in-line sub-surface seeding, fertilizing and watering device comprising an in-line blade mounted to a header member of a parallelogram linkage so as to be vertically downwardly disposed



generally in a plane containing said linkage, said blade having internal conduits for transporting seed, fertilizer or water from an upper infeed to openings at a lower end of said blade, said parallelogram linkage comprising a pair of parallel rigid drag arms extending between said header member and a hanger member, said arms pinned at their respective ends to said header and hanger members so that rotation of said header member relative to said hanger member on said parallel arms maintains a generally horizontal orientation of said header member thereby supporting said blade, when mounted in said header member, downwardly in a constant orientation, wherein said hanger member is mountable to a supporting frame, said device further comprising selective actuation means for selective control of a downward force urging said blade, when on said header member, downwardly into soil.

US 6,408,773 B2

MACHINE FOR CUTTING CLOTH AND APPLYING BORDERS AND A PERIPHERAL BAND TO CLOTHS USED TO MANUFACTURE SPRING MATTRESSES

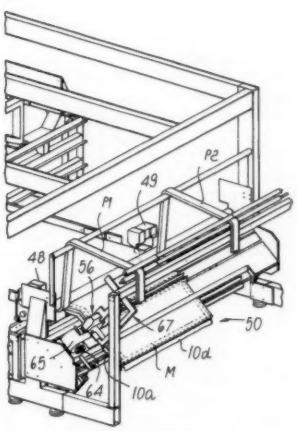
Roberto Resta, Faenza, Italy, assignor to Resta S.r.l., Faenza, Italy

Filed Jan. 11, 2001, Appl. No. 757,590

Claims priority, application Italy, Jan. 28, 2000, BO00A0033

Int. Cl. D05B *11/00;35/06;37/04*

U.S. Cl. 112—2.1 **9 Claims**



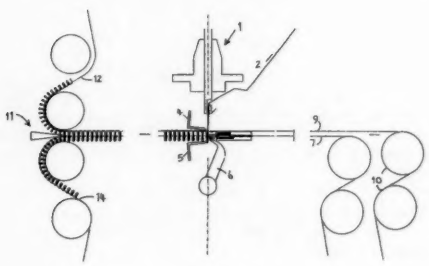
1. A machine for cutting cloths and applying borders thereto, for the manufacture of mattresses starting from at least one component sheet which is wound in a roll, including: a framework, movement means for moving said cloth in an advancement direction and along a horizontal plane of arrangement; two sewing machines for forming longitudinal stitch lines along the lateral edges of said cloth, said sewing machines being arranged upstream of said movement means, and being each provided with a support for a roll of strip made of fabric which is guided and stitched along a

respective longitudinal edge of said cloth; guides which lie transversely to the advancement direction of the cloth; and a finishing assembly arranged downstream of said movement means and comprising: a carriage which is slideable on said guides; a finishing sewing machine of a type having at least two needles and supported on said carriage; a support; a roll supported at said support for a fabric band which is guided so as to adhere transversely to said cloth, said finishing sewing machine being operatable to join said band to said cloth along at least two transverse stitch lines; actuating means for actuating said carriage on said guides between two stroke limit positions which lie laterally to said cloth, and cutting means for cutting said band and said quilt between said two stitch lines and for forming two transverse strips.

US 6,408,774 B1
METHOD OF PRODUCING A TUFTED ARTICLE OR PRODUCT

Warren J. Meade, Christchurch, New Zealand, assignor to Groz-Beckert KG, Germany

PCT No. PCT/EP98/05133, § 371 Date Jun. 1, 2000, § 102(e) Date Jun. 1, 2000, PCT Pub. No. WO99/09241, PCT Pub. Date Feb. 25, 1999
PCT Filed Aug. 12, 1998, Appl. No. 485,633
Int. Cl. D05C *15/14*
U.S. Cl. 112—80.32 **10 Claims**



1. A method of producing tufted products with a tufting machine on which a second set of reed fingers (**8**) and, optionally, a lower presser foot (**5**) has/have been installed, said method including the steps of feeding to the tufting machine a pair of backing sheets (**7**,**9**) with the second set of reed fingers (**8**) positioned between the backing sheets (**7**,**9**);

operating the tufting machine in normal manner to form through the backing sheets (**7**,**9**) a face-to-face structure without the inclusion of any additional/extra backing stitch and in which the lower presser foot (**5**) if included temporarily holds the yarn during needle retraction;

cutting or dividing the face-to-face structure to form two separate tufted products.

US 6,408,775 B2
SEWING OR EMBROIDERY MACHINE

Jürgen Hartwig, Pforzheim, Germany, assignor to Viking Sewing Machines AB, Sweden

Filed Mar. 22, 2001, Appl. No. 815,322
Claims priority, application Germany, Mar. 23, 2000, 100 14 534
Int. Cl. D05B *19/12;87/04*
U.S. Cl. 112—470.04 **13 Claims**

1. A sewing or embroidery machine, comprising:

a microprocessor;

an entry device for entering commands;

a display screen;

a memory device;

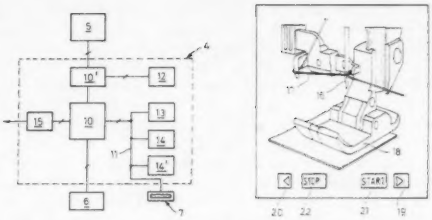


image data for explaining the operation of the sewing or embroidery machine stored in the memory device, said microprocessor, after receiving a corresponding command, reading the image data characteristic for the explanation of the selected operation of the sewing or embroidery machine from the memory for the corresponding command and transferring said image data, said microprocessor processing said image data prior to transferring image data;

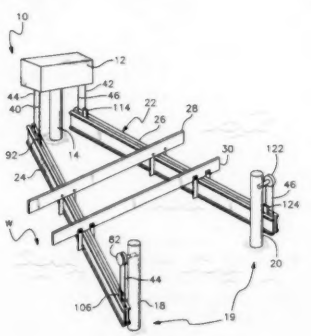
image memory; and

an application-specific circuit, said microprocessor being connected to said image memory via said application-specific circuit, said microprocessor transferring said image data and loading said image data in said image memory via said application-specific circuit, said application-specific circuit cyclically reading the image data stored in the image memory and making image data available for the display screen such that the particular operating procedure is displayed in the form of animated images or sequential images on the display screen based on the cyclical reading of the image data stored in the image memory.

US 6,408,776 B1
SYNCHRONOUSLY DRIVEN, MULTIPLE CABLE BOAT LIFT

Shawn M. McLaughlin, Punta Gorda; Daniel S. Carter, Fort Myers; Charles L. Sargent, Bonita Springs, and John Kohlhauff, Estero, all of Fla., assignors to Quality Boat Lifts, Inc., Fort Myers, Fla.

Continuation-in-part of application No. 09/585,116, filed on Jun. 1, 2000, now Pat. No. 6,230,639. This application Oct. 20, 2000, Appl. No. 693,435.
This patent is subject to a terminal disclaimer.
Int. Cl. B63C *7/00*
U.S. Cl. 114—44 **28 Claims**



1. A single motor, synchronously driven boat lift comprising:

a proximal support structure locatable on a first side of the boat to be lifted;

a distal support structure locatable on an opposite second side of the boat;

a single motor mounted on said proximal support structure and being selectively driven in opposing first and second directions;

a boat accommodating platform located between said proximal and distal support structures and including an elongate pair of interconnected cradle beams for extending across and beneath the boat from the first side to the second side of the boat, each said beam having a proximal portion and a distal portion positionable respectively on the first and second sides of the boat; and

means operably interconnecting said motor and said platform for synchronously raising said proximal and distal portions of said beams when said motor is driven in said first direction and lowering said proximal and distal portions of said beams when said motor is driven in said second direction, whereby the boat supported on said platform is raised and lowered, respectively;

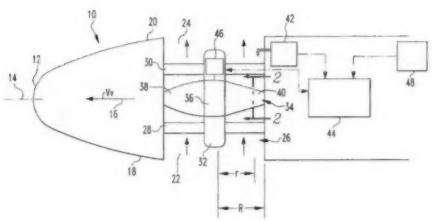
said means for raising and lowering including a pair of proximal cables, each of which is operably connected to said proximal portion of a respective beam for enabling raising and lowering thereof and a pair of distal cables, each of which is operably connected to said distal portion of a respective said beam for enabling raising and lowering thereof, said means for raising and lowering further including a winder assembly that is rotatably interconnected to said motor and having a pair of relatively large diameter winder drums operably connected to respective distal cables and a second pair of relatively small diameter winder drums operably connected to respective proximal cables.

US 6,408,777 B1

SIDE THRUSTER PERFORMANCE IMPROVEMENT WITH SPEED CONTROL

Charles H. Beauchamp, Jamestown, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 26, 2001, Appl. No. 842,703
Int. Cl. B63H *25/00*
U.S. Cl. 114—151 **20 Claims**



1. A marine vehicle having enhanced maneuverability comprising:

a hull at least partially submerged in a fluid having a forward bow, and a longitudinal axis extending rearwardly from said bow and opposed first and second sides and said first and second sides having respectively a first opening and a second opening;

a fluid conducting means having a length and extending generally transversely through the hull from the first opening on the first side of the hull to the second opening on the second side of the hull;

a propeller having at least one blade on which the fluid exerts a lift force (L);

means for causing fluid to flow at an axial fluid velocity (Vx) through the fluid conducting means;

means for driving the propeller to achieve an adjustable angular speed (N);

means for measuring the axial fluid velocity (Vx); and

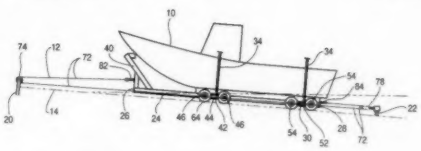
computer means for adjusting the angular speed (N) of the propeller based on the axial fluid velocity (Vx) to approximately optimize the lift force (L) on the propeller blade.

US 6,408,778 B1

WATERCRAFT RETRIEVER LIFT

Donald M. Wood, II, Stuart, Fla., assignor to Hi-Tide Sales, Inc., Fort Pierce, Fla.

Filed Aug. 22, 2000, Appl. No. 643,461
Int. Cl. B63B *25/16*
U.S. Cl. 114—230.22 **25 Claims**



1. A watercraft retriever lift adapted to move a watercraft overland while directly positioned in abutment with the contour of the land surface located between a first deadman fixed member and a second deadman fixed member comprising:

A. a carrier frame means for supporting a watercraft thereon to facilitate moving of the watercraft overland between a first position adjacent the first deadman fixed member and a second position adjacent the second deadman fixed member, said carrier frame means including a first end means and a second end means spatially disposed apart from one another, said first end means being closer than said second end means to the first deadman fixed member and said second end means being closer than said first deadman member to said second deadman fixed member;

B. an articulated suspension means attached to said carrier frame means to facilitate ease of movement thereof over the land surface contour between said first deadman fixed member and said second deadman fixed member with a watercraft thereupon, said articulated suspension means including:

(1) an articulating arm member pivotally mounted with respect to said carrier frame means and extending longitudinally therealong, said articulating arm member being pivotally movable with respect to said carrier frame means with an axis of rotation oriented laterally with respect thereto;

(2) a plurality of axle members mounted in said articulating arm member to be movable therewith with respect to said carrier frame means and extending laterally outwardly therefrom to facilitate movement thereof relative to said carrier frame means to facilitate movement thereof following the land surface contour between said first deadman fixed member and said second deadman fixed member;

C. a plurality of wheel means rotatably secured to said axle members of said articulated suspension means to be movable therewith relative to said carrier frame means to facilitate movement of said carrier frame means and a watercraft supported thereon over varying land surface contours between said first dead man fixed member and said second dead man fixed member;

D. a continuous longitudinal means attached to said carrier frame means and extending between said first deadman fixed member and said second deadman fixed member to facilitate moving of said carrier frame means therebetween between the first position and the second position, said continuous longitudinal member being attached to said first end means and extending therefrom to attachment to the first deadman fixed member and extending therefrom to attachment to the second deadman fixed member and extending therefrom to attachment to said second end means; and

E. a winch means operatively attached to said continuous longitudinal means to urge longitudinal movement thereof to cause movement of said carrier frame means and any watercraft

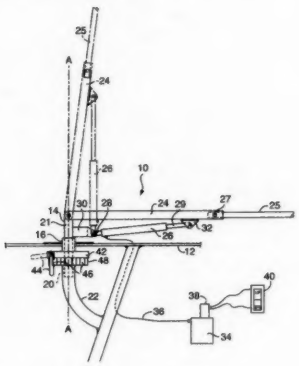
supported thereupon between the first position and the second position, said continuous longitudinal means extending along said carrier frame means without any engagement therewith to freely extend directly from said winch means to said second deadman fixed member to facilitate movement of said carrier frame means relative to said second deadman fixed member as desired.

US 6,408,779 B1

ADJUSTABLE OUTRIGGER

George Roy, 16-106 Royal Palm Way, Boca Raton, Fla. 33432

Filed Oct. 2, 2001, Appl. No. 970,384
Int. Cl. B63B *3/00*
U.S. Cl. 114—255 **19 Claims**



1. An outrigger for use with a fishing boat having a support surface for mounting the outrigger thereon, said outrigger comprising:

a vertical member rotatable about a vertical axis, said vertical member having an upper portion extending above said support surface and a lower portion extending below said support surface;

means attached to said support surface for rotatably supporting said vertical member;

support means attached to said boat below said support surface for rotatably supporting said lower portion of said vertical member;

a boom member having a first end thereof pivotably coupled to said upper portion of said vertical member for movement about a horizontal axis;

a variable length cylinder having first and second ends thereof, said first end of said cylinder pivotably coupled to said upper portion of said vertical member, said second end of said cylinder pivotably coupled to said boom member, wherein the angular position of said boom member relative to said vertical member is adjustable by varying the length of said cylinder;

a control system coupled to said cylinder for controlling the length thereof; and wherein,

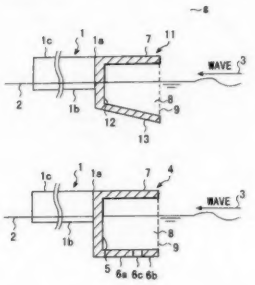
said angular position of said boom member relative to said vertical member is adjustable via said control system.

US 6,408,780 B1

WAVE-RESISTANT MEGA-FLOAT

Masahiko Ozaki; Shuji Mizokami; Makoto Ohta, all of c/o Nagasaki Research & Development Center Mitsubishi Heavy Industries, Ltd., 717-1, Fukahori-machi 5-chome, Nagasaki, Nagasaki-ken, Japan, and Ikuo Hosomi, c/o Nagasaki Shipyard & Machinery Works Mitsubishi Heavy Industries, Ltd., 1-1, Akunoura-machi, Nagasaki, Nagasaki-ken, Japan

Filed Oct. 29, 1999, Appl. No. 430,317
Claims priority, application Japan, Oct. 30, 1998, 10-311342
Int. Cl. B63B *35/44*
U.S. Cl. 114—264 **10 Claims**



1. A wave-resistant mega-float having a floating body with a front end portion and a bottom surface comprising:

a first flat plate provided on the front end portion of said floating body of the wave-resistant mega-float and extending downward below the bottom surface of the floating body penetrating a water surface, said front end portion of the floating body being located on an upstream side in a direction from which waves travel; and

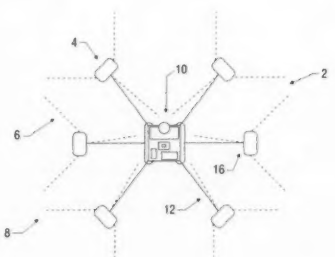
a second flat plate, having a through hole for passing water therethrough, attached substantially perpendicularly to a lower end portion of the first flat plate such that the second flat plate extends toward the upstream side.

US 6,408,781 B1

MOORING SYSTEM AND METHOD FOR DEEP AND ULTRA DEEP WATER

Jim T. Daniels, Chobham Surrey, United Kingdom, assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 29, 1998, Appl. No. 162,941
Int. Cl. B63B *21/50*
U.S. Cl. 114—293 **19 Claims**



3. A mooring system for mooring a floating apparatus in deep and ultra deep water comprising:

three or more buoys located at a depth under the surface of a body of water;

a means of keeping said buoys in a substantially stationary position even when the buoys are not moored to said floating apparatus; and

a means for receiving mooring lines on said buoys.

US 6,408,782 B1

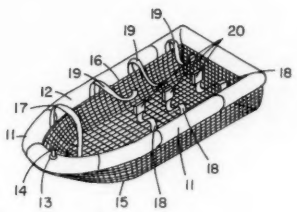
DAMAGED BOAT FLOATATION SYSTEM

Carl P. Mitchell, 1580 W. 8th St. Apt. 165, Upland, Calif. 91786

Filed Mar. 16, 2001, Appl. No. 810,065

Int. Cl. B63B *43/02*

U.S. Cl. 114—360 **18 Claims**



1. A damaged boat floatation system comprising:

a floatation assembly including air inflatable tubular members being attached end-to-end to form an endless tube being adapted to fit about sides of a boat;

a compressed air container for filling said endless tube with compressed air; and

a net member for disposing below the boat, said net member being attached to and along said endless tube.

US 6,408,783 B1

POINTER INSTRUMENT

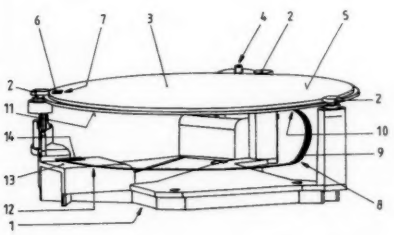
Bernd Ludewig, Hirschberg, Germany, assignor to Mannesmann VDO AG, Frankfurt, Germany

Filed Dec. 21, 1999, Appl. No. 469,057

Claims priority, application Germany, Dec. 22, 1998, 198 59 339; Apr. 10, 1999, 199 16 221

Int. Cl. G01P *1/08;* **G01D** *13/28*

U.S. Cl. 116—288 **9 Claims**



1. A pointer instrument, having a disk pointer which is illuminatable by a light source, the disk pointer being formed in one of a circle or circular ring and being connected to a flexible lead, wherein the lead (**8**) runs at least approximately concentrically curved in relation to the disk pointer (**3**) and has two legs (**10**, **12**) joined by a 180° bend (**9**), a first of said legs (**10**) resting against a rear (**11**) of the disk pointer (**3**) and a second of said legs (**12**) being fixed to a rear component (**13**) of the pointer instrument (**1**), with an axial spacing from the disk pointer (**3**).

US 6,408,784 B1

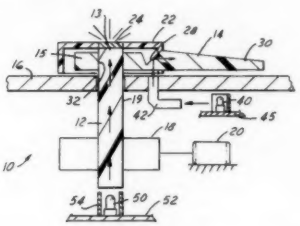
INSTRUMENT POINTER WITH INTEGRAL WARNING INDICATOR

David Alan Ross, Columbiaville, Mich., assignor to Delphi Technologies, Inc., Troy, Mich.

Filed May 30, 2000, Appl. No. 579,482

Int. Cl. G01D *11/28*

U.S. Cl. 116—288 **7 Claims**



1. An illuminated indicator member for a gauge in a vehicle comprising:

a light transmitting shaft member having a first end and a second end;

means for rotating said shaft member;

a pointer member positioned on said first end of said shaft member, said pointer member having a body portion and a finger portion;

a first light source for providing illumination to said finger portion;

a second light source for providing illumination to said second end of said shaft member, through said shaft member and to an indicator panel visible through a cap member on said body portion, light from said second light source being prevented from traveling from said shaft member into said pointer member, wherein illumination of said indicator panel is independent from illumination of said pointer member;

wherein when said second light source is illuminated, a warning indicator is made visible to the vehicle operator.

US 6,408,785 B1

DEVICE FOR WETTING FLEXIBLE MAT-SHAPED CARRIER MATERIALS

Norbert Hoogen, Kleve; Dieter Lencer, Wegberg, and Christoph Pekal, Krefeld, all of Germany, assignors to Heidel GmbH & Co. KG Werkzeug- u. Maschinenfabrikation, Viersen, Germany

Filed May 24, 2000, Appl. No. 577,553

Claims priority, application Germany, Oct. 11, 1999, 299 17 899 U; European Pat. Off., Nov. 3, 1999, 99120964; Germany, Nov. 19, 1999, 299 20 322 U

Int. Cl. B05C *7/02*

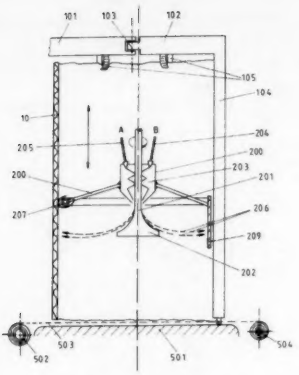
U.S. Cl. 118—33 **5 Claims**

1. A device for wetting a flexible mat-shaped carrier material (**10**) comprising:

guiding elements for the transport and guiding of the carrier material configured in such a way that at least one hollow space limited by the carrier material is constituted,

a spray device (**200**) configured to be introduced into the at least one hollow space for wetting an upper surface of the carrier material which is turned to an inner side of the hollow space,

wherein the transport and guiding elements are constituted by a frame with side ledges (**101**, **102**, **104**) having clamping means for clamping the carrier material mat (**10**),



wherein at least one flexible side ledge (**101**, **102**) is configured to be reversibly brought from a stretched form into a bent form.

US 6,408,786 B1

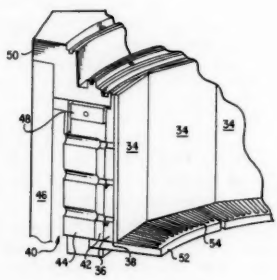
SEMICONDUCTOR PROCESSING EQUIPMENT HAVING TILED CERAMIC LINER

William S. Kennedy, Redwood Shores; Robert A. Maraschin, Cupertino, and Jerome S. Hubacek, Fremont, all of Calif., assignors to Lam Research Corporation, Fremont, Calif.

Filed Sep. 23, 1999, Appl. No. 401,193

Int. Cl. C23C *16/507*

U.S. Cl. 118—723 AN **20 Claims**



1. A plasma processing system useful for processing semiconductor substrates comprising:

a plasma processing chamber having an interior space bounded by a chamber sidewall;

a substrate support on which a substrate is processed within the interior space, the chamber sidewall being spaced outwardly of a periphery of the substrate support;

a gas supply through which process gas can be supplied to the interior space during processing of the substrate;

an energy source which can energize the process gas in the interior space into a plasma state during processing of the substrate;

a ceramic liner supported between the chamber sidewall and the periphery of the substrate support, the ceramic liner comprising an assembly of ceramic tiles, the tiles being attached to a support member by an elastomeric joint.

US 6,408,787 B1

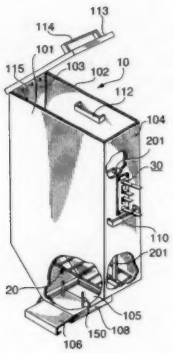
TRANSPORTABLE ANIMAL FEED STORAGE BIN

Donald P. Clark, 6721 Louisville Rd., Cox's Creek, Ky. 40013

Filed Apr. 19, 2000, Appl. No. 552,541

Int. Cl. A01K *5/00*

U.S. Cl. 119—51.01 **14 Claims**



1. A transportable animal feed storage bin, comprising:

a refillable hopper having a dispensing opening in a lower portion thereof, means to selectively open and close said opening, agitator means movably mounted in said hopper to loosen clumps of feed therein, said agitator means including a rigid elongate member, an open grate assembly secured to and projecting from said elongate member, mounting and guide means mounting said rigid member in said hopper for reciprocal movement and operating means on said mounting means to reciprocally move said agitator, said operating means comprising a plurality of levers, springs and aperatured washers to releaseably lock said bar and levers to move said bar.

US 6,408,788 B1

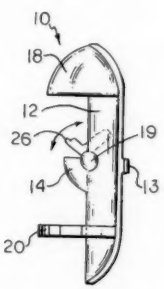
BI-MODAL SEED PORT FOR BIRD FEEDER

Robert Paul Lieb, and James Roberts Obenshain, both of Peebles, Ohio, assignors to Cedar Works, LLC, Peebles, Ohio

Filed Apr. 6, 2001, Appl. No. 826,775

Int. Cl. A01K *61/02*

U.S. Cl. 119—52.2 **5 Claims**



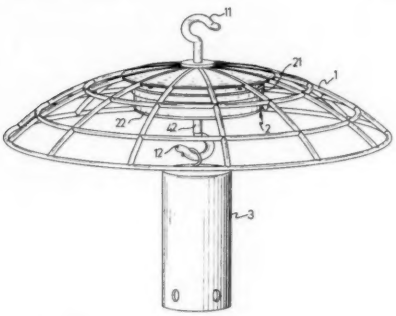
1. A bi-modal seed port for a bird feeder, said feeder having a columnar reservoir for the containment of seeds, said reservoir having at least one opening in the side of said column to provide access to the contained seeds, and wherein said seed port comprises:

a vertical platform attachable to said reservoir and having an opening in alignment with an opening in the wall of said reservoir;

a trough on the anterior surface of said platform for collecting seeds flowing naturally through the aligned openings in the reservoir and the seed port platform; and

a hinged lid attached to said trough and positioned to pivot thus providing alternative access to seeds in the trough or to seeds in the reservoir.

US 6,408,789 B1
REPELLING DEVICE FOR BIRD FEEDER
Feng-Shen Hsiao, Taipei, Taiwan, assignor to Rite-Tech Industrial Co., Ltd., Taipei, Taiwan
Filed Jan. 4, 2002, Appl. No. 39,145
Int. Cl. A01K *39/00*
U.S. Cl. 119—57.9 **7 Claims**



1. A repelling device for a bird feeder having a food container, the repelling device comprising:

a retainer having a bottom retainer adapted to detachably connect to the food container, a top retainer adapted to allow the bird feeder to be hung on an object and a central shaft adjoining the top and bottom retainers;

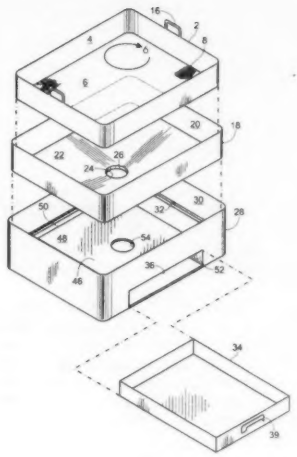
a repelling disk rotatably and movably mounted around the central shaft and having an annular extension mounted around the central shaft of the retainer and an annular flange integrally formed on an inner face of the repelling disk and extending downward;

a housing securely engaged with the central shaft to receive therein a driving device to selectively drive the repelling disk to rotate; and

multiple sensors each securely mounted in the housing and partially extending out of the housing to be detachably engaged with the annular flange,

whereby the repelling disk is selectively driven by the driving device to rotate when the repelling disk is moving toward the housing to allow the annular flange to engage with a corresponding one of the sensors.

US 6,408,790 B1
ANIMAL LITTER BOX
Sara Barbara Maguire, 14075 Alika Dr., Seal Rock, Oreg. 97376
Filed Apr. 13, 2000, Appl. No. 548,577
Int. Cl. A01K *29/00*
U.S. Cl. 119—166 **9 Claims**



1. A litter tray with liquid permeable bottom means for supporting and retaining a quantity of litter and an animal,

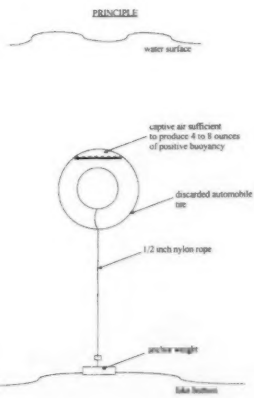
A drain pan with an upstanding perimeter wall and a floor sloping inwardly and downwardly from said perimeter wall, said floor including a drain pan hole positioned at lowest point of said floor, said drain pan sized to support said litter tray snugly within said drain pan perimeter wall and positioned so that an air gap remains between said litter tray liquid permeable bottom means and said drain pan floor whereby liquid can pass through the liquid permeable bottom means of said litter tray and down said drain pan floor through the drain pan hole;

a reservoir drawer;

a base with an upstanding perimeter wall sized to receive said drain pan snugly within said base perimeter wall, said base including an opening in said base perimeter wall, said opening sized and positioned to receive said reservoir drawer for collection of liquid waste by,the reservoir drawer; said reservoir drawer removably placed within said base through said opening in said base perimeter wall and positioned so that liquid waste flowing through said drain pan hole is received by said reservoir drawer; and

a housing for said drawer, said housing including a top with an opening positioned and sized to receive liquid waste.

US 6,408,791 B1
UNDERWATER FISH HABITAT
Robert D. O'Dell, 407 W. 7th St., Ogallala, Nebr. 69153
Provisional application No. 60/138,613, filed on Jun. 11, 1999.
This application Jun. 12, 2000, Appl. No. 591,688.
Int. Cl. A01K *61/00*
U.S. Cl. 119—221 **19 Claims**



1. An artificial underwater habitat comprising:

a structure having a downwardly opening cavity and an upwardly opening cavity,
a buoyant material in said downwardly opening cavity; and
an anchor operatively connected to said structure;
said structure being maintained in a predetermined orientation by the material in said cavity and the anchor.

US 6,408,792 B1
METHOD OF INCREASING SEAFOOD PRODUCTION IN THE BARREN OCEAN WITH A FERTILIZER COMPRISING CHELATED IRON

Michael Markels, Jr., 6850 Versar Center. P.O. Box 1549, Springfield, Va. 22151

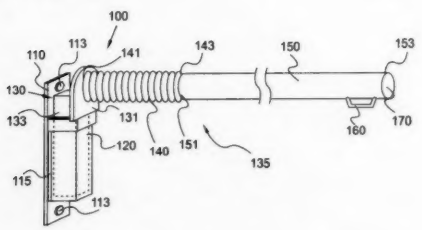
Continuation of application No. 09/761,680, filed on Jan. 18, 2001, which is a continuation of application No. 09/521,895, filed on Mar. 9, 2000, now Pat. No. 6,200,530, which is a continuation of application No. 09/304,063, filed on May 4, 1994, now Pat. No. 6,056,919, which is a continuation of application No. 08/950,418, filed on Oct. 24, 1997, now Pat. No. 5,467,087, Provisional application No. 60/033,018, filed on Dec. 17, 1996. This application Oct. 19, 2001, Appl. No. 982,197.
This patent is subject to a terminal disclaimer.
Int. Cl. A01K *61/00*
U.S. Cl. 119—231 **20 Claims**

1. A method of increasing seafood production in the ocean comprising the following steps:
(1) testing an area of the surface of the ocean, in order to determine a first nutrient that is missing to a significant extent; and
(2) applying a first fertilizer which comprises said first missing nutrient, to fertilize said area of the surface of the ocean with an appropriate amount of said first missing nutrient, wherein said first fertilizer comprises an iron chelate, and said first fertilizer releases said missing nutrient in a form that does not precipitate to any substantial extent; and
(3) harvesting at least a portion of the increased production of seafood that results from said fertilization of said ocean.

US 6,408,793 B1
FLEXIBLE AND REMOVABLY DETACHABLE TIE-OUT AND SYSTEM OF SAME

Stephen W. Rutter, Patagonia, Ariz., assignor to Khubli, LLC, Patagonia, Ariz.

Filed Oct. 16, 2000, Appl. No. 690,052
Int. Cl. B60P *3/04*
U.S. Cl. 119—400 **17 Claims**

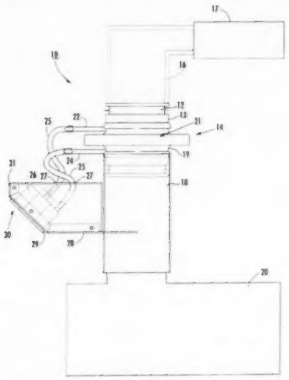


1. A tie-out adapted to be removably coupled to a structure, the tie-out comprising:
a pipe removably coupled to a flexible portion and extending outwardly therefrom, wherein the pipe is approximately 38" long with approximately a 1 ⅞" outside diameter; and
the flexible portion having a quiescent state and a flexed state, whereby the application of a predetermined amount of pressure on the flexible portion can move the flexible portion from its quiescent state to its flexed state, the flexible portion adapted to return to its quiescent state as the amount of pressure lessens to an amount below the predetermined amount of pressure, wherein the flexible portion is approximately 9" long with approximately a 2 ⅝" outside diameter.

US 6,408,794 B1
DEVICE FOR DISPLAYING AN AIR FLOW CONDITION IN A RACK FOR ANIMAL CAGES

Michael A. Coiro, Sr., Jacobstown; Frank J. Herdt, Bordentown, and Brian M. Bilecki, Trenton, all of N.J., assignors to Allentown Caging Equipment Co., Inc., Allentown, N.J.

Filed Oct. 20, 2000, Appl. No. 693,156
Int. Cl. A01K *1/00*
U.S. Cl. 119—418 **25 Claims**

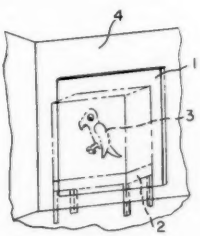


1. A device for displaying a condition of air flow to or from a ventilated rack of animal cages comprising:
a damper adapted to be coupled between a drop of an air flow system and said ventilated rack of animal cages;
means for measuring pressure within said damper, and
a display for visually displaying a condition of the measured pressure.

US 6,408,795 B1
DECORATIVE AVIAN ANTI-SPLATTER WALL PANEL

John Goodger, 7 Minti Rd., Coram, N.Y. 11727

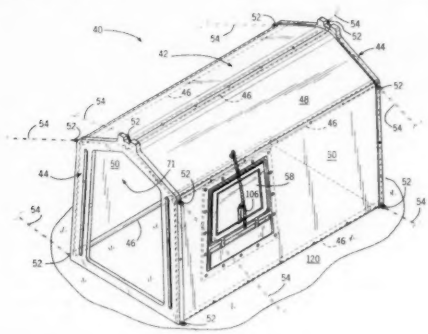
Filed Mar. 27, 2001, Appl. No. 820,161
Int. Cl. A01K *31/06*
U.S. Cl. 119—469 **9 Claims**



1. A combination bird cage and avian splatter containment device protecting a wall located adjacent to said bird cage, said comnbination comprising:
a bird cage having a plurality of spaced-apart structural posts, a roof and a floor,
a decorative washable protective panel removably adherable to a wall adjacent to said bird cage, said panel catching bird eating

splatter spit out from a bird during eating, said decorative washable panel protecting the wall adjacent to said bird cage by capturing the bird food splatter, said decorative washable protective panel being located adjacent to said bird cage.

US 6,408,796 B1
RESIN HUTCH AND METHOD OF ASSEMBLY
Lance T. Hampel, 5678 W. Big Portage Lake Rd., Land O'Lakes, Wis. 54540
Provisional application No. 60/154,997, filed on Sep. 21, 1999. This application Nov. 10, 1999, Appl. No. 437,465.
Int. Cl. A01K *1/02;* **E04H** *15/00*
U.S. Cl. 119—498 **34 Claims**



1. An improved plastic resin structure defining an enclosure including a top, sides and ends, at least one of the sides and ends having a door panel comprised of a first wall and a second wall, wherein the door panel is molded so that the first wall is fused to the second wall in some locations and separated from the second wall in other locations, the improvement wherein:

the first and second walls are separated along a door perimeter such that removal of a portion of the second wall extending along at least three sides of the door perimeter and removal of a portion of the first wall extending along the same three sides of the door perimeter defines a door made of the first and second walls that is integrally hinged to the door panel and wherein the second wall of the door panel defines a door opening within the door perimeter having a projecting rim and the first wall of the door defines a lip sized to overlap the door opening rim.

US 6,408,797 B2
COLLAPSIBLE PET CARRIER
Scott Pivonka, 6547 S. Field Way, Littleton, Colo. 80123, and John Tottleben, 299 McDougal, Bailey, Colo. 80421
Continuation of application No. 09/323,423, filed on Jun. 1, 1999, now Pat. No. 6,216,638. This application Apr. 3, 2001, Appl. No. 825,396.
This patent is subject to a terminal disclaimer.
Int. Cl. A01K *1/03*
U.S. Cl. 119—498 **9 Claims**

1. A collapsible pet housing structure comprising:

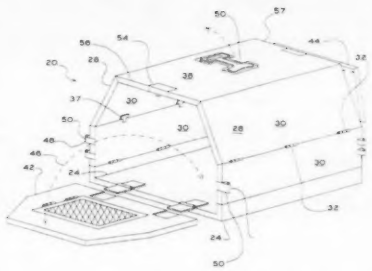
a floor panel having a pair of parallel sides and a pair of ends extending between the sides;

a pair of generally opposing walls hingedly attached to the parallel sides of said floor panel, each wall comprising at least two generally planar wall panels connected to one another by a hinge connection, each of the wall panels having an external surface and an internal surface, the internal surface of the wall panels of one wall facing the internal surface of the wall panels of the opposing wall, the hinged connection between the wall panels allowing the wall panels to cooperate with one another to retain the external surfaces of the wall panels at an angle greater than 180 degrees relative to one another, so that the hinged connection allows movement of the wall panels from:

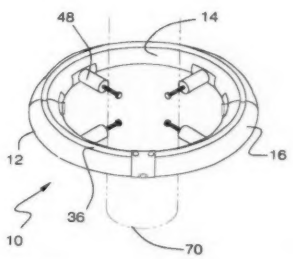
a first position where the external surfaces of the wall panels are at an acute angle relative to one another to a second position where the external surfaces of the wall panels are retained at an angle greater than 180 degrees relative to one another;

a roof panel, the roof panel being of a weight and extending between the walls and being hingedly connected to said walls; and

a pair of endwalls, each endwall being hingedly attached to said floor panel at opposing ends of the floor panel, the endwalls pivoting to a generally normal position with said floor panel to cooperate with said wall panels when said wall panels are in said second position to retain the external surfaces of the wall panels at the second position relative to one another, so that the roof panel is supported by said endwalls when said wall panels are at the second position.



US 6,408,798 B1
TANGLE RESISTANCE PET TIE DEVICE
Larry Van Damme, 153 Landon Ave., Newark, N.Y. 14513
Filed Feb. 2, 2001, Appl. No. 775,438
Int. Cl. A01K *3/00*
U.S. Cl. 119—787 **5 Claims**



1. A tangle resistant pet tie apparatus for removably coupling to a vertical implement, said apparatus comprising:

an annular member having an inner surface, an outer surface, a top surface and a bottom surface, said annular member having a pair of oppositely positioned breaks therein, such that a first portion and second portion of said annular member are defined said first and second portions being removably couplable to each other;

a clamp for positioning on said annular member, said clamp comprising a ring having a break therein, wherein said clamp is movable about said annular member;

a band being securely attached to an outer surface of said clamp and extending in an opposite direction of said break in said clamp;

a plurality of protruding members being securely coupled to the inner surface of said annular member such that a free end of each of said protruding members radially extends toward an axis of said annular member, each of said free ends having a bore extending therein, each of said protruding members being movable through said break in said clamp;

a plurality of elongated rods having a first end and a second end, each of said first ends of said rods being movably extendable in one of said bores; and

wherein said annular member is positionable around said vertical implement and said elongated rods extended to abut said vertical implement.

US 6,408,799 B1

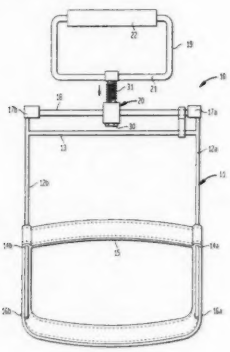
DOG GUIDE HARNESS WITH MULTI-POSITION HANDLE ASSEMBLY

Lukas Franck, Stanhope, N.J., assignor to The Seeing Eye, Inc., Morristown, N.J.

Filed Mar. 14, 2001, Appl. No. 808,446

Int. Cl. A01K *27/00*

U.S. Cl. 119—793 **11 Claims**



1. A dog guide harness for a dog guide comprising:

a. a harness frame including, means for adjustably mounting the harness frame to the dog guide, and

b. a handle assembly, including a self-locking linking means for fixedly, pivotally and rotatably connecting the handle assembly to said harness frame to enable said handle assembly to be alternatively and selectively pivoted along the longitudinal line and rotated between at least a first fixed position and a second fixed position relative the longitudinal line of said dog guide harness.

US 6,408,800 B2

SEPARATOR FOR A WATER/STEAM SEPARATING APPARATUS

Holger Schmidt, and Eberhard Wittchow, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of application No. PCT/DE99/02434, filed on Aug. 5, 1999. This application Feb. 20, 2001, Appl. No. 789,794.

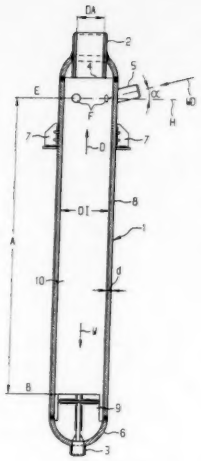
Claims priority, application Germany, Aug. 17, 1998, 198 37 250

Int. Cl. F16T *1/00*

U.S. Cl. 122—488 **7 Claims**

1. A separator for separating water and steam, comprising:

a number of inlet conduits each having a flow cross section defining an overall flow cross section equaling a sum of said flow cross sections;



a separating chamber between said number of inlet conduits having a length, a separating chamber inner diameter, and a ratio equaling a ratio of said overall flow cross section to a square of said separating chamber internal diameter; said length being at least five times said separating chamber internal diameter; and said ratio being between 0.2 and 0.3;

a steam-side outlet conduit connected to said separating chamber;

a water-side outlet conduit connected to said separating chamber; and

a swirl breaker disposed upstream of said water-side outlet conduit.

US 6,408,801 B1

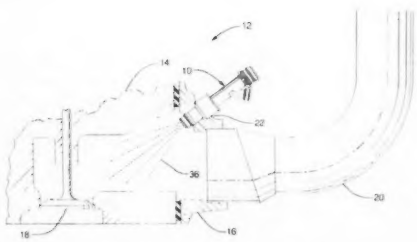
METHOD FOR DISSIPATING HEAT AT THE TIP OF A FUEL INJECTOR

Lewis Allen Frostick, Sterling Heights; Donald L. Thorson, Oakland; Scott Willis Jorgensen, Bloomfield Township, all of Mich., and Kenneth William Turner, Webster, N.Y., assignors to Delphi Technologies, Inc., Troy, Mich.

Filed Apr. 26, 2000, Appl. No. 558,624

Int. Cl. F01P *1/06*; **F02M** *15/00*

U.S. Cl. 123—41.31 **20 Claims**



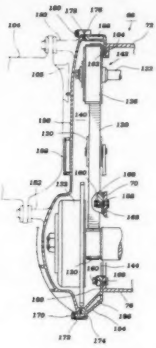
1. A fuel injection system for use in an internal combustion engine, the engine having at least one cylinder head cover, comprising: a fuel injector assembly inserted into an inlet in the cylinder head cover, the fuel injector assembly includes an upper body portion and a lower body portion that partially extends through the inlet of the cylinder head cover, wherein at least part of the lower body portion is comprised of a low absorbent material having a high reflectance color for reflecting heat away from the lower body portion of the fuel injector assembly.

US 6,408,802 B1

CAM DRIVE COOLING ARRANGEMENT

Keiya Funahashi, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Oct. 2, 2000, Appl. No. 676,920
Claims priority, application Japan, Sep. 30, 1999, 11-278307; Oct. 29, 1999, 11-308101; Oct. 29, 1999, 11-308107
Int. Cl. F01P *1/06*
U.S. Cl. 123—41.31 **29 Claims**



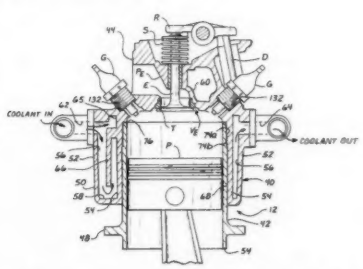
1. An engine for a personal watercraft, said engine comprising an engine body comprising a crankcase member, a cylinder block and a cylinder head, at least one cam shaft extending outside of said engine body, a driven pulley attached to said at least one cam shaft and being positioned outside of said engine body, a crankshaft also extending outside of said engine body, a drive pulley connected to said crankshaft and being positioned outside of said engine body, a flexible transmitter looped around said driven pulley and said drive pulley, a chamber being defined by at least a portion of said engine body and a first cover member, a cooling jacket extending through at least a portion of said first cover member.

US 6,408,803 B1

LIQUID COOLING SYSTEM AND RETROFIT FOR HORIZONTALLY OPPOSED AIR COOLED PISTON AIRCRAFT ENGINES

Robert M. Atkins, 1413 Prospect Ave., Hermosa Beach, Calif. 90254

Filed Oct. 19, 2000, Appl. No. 693,757
Int. Cl. F02F *1/10*
U.S. Cl. 123—41.81 **42 Claims**



1. A replacement cylinder for use in providing liquid cooling to an air cooled internal combustion engine of the type having one or more piston cylinders exterior to a crankcase block, said replacement cylinder comprising:

a unitary casting including a cylinder head portion, intake and exhaust ports and spark plug openings in said head portion; said cylinder head having coolant passages therein; and a double walled jacket defining an annular coolant cavity having an open end and an opposite end closed by a head portion having intake and exhaust ports, said head portion including coolant passages in fluidic communication with said annular coolant cavity, a coolant inlet and a coolant outlet on said jacket for circulating coolant through said coolant cavity and said coolant passages;

a flow gate near said coolant inlet for diverting a substantial portion of coolant flow from said inlet into said coolant passages and the balance of the coolant flow into said coolant cavity; and

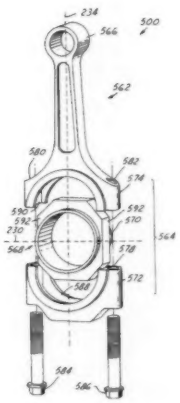
a cylinder sleeve fitted to said open end of said double walled jacket of said unitary casting.

US 6,408,804 B1

APPARATUS FOR VARYING THE COMPRESSION RATIO OF AN INTERNAL COMBUSTION ENGINE

V. Durga Nageswar Rao, Bloomfield Hills; Mark Michael Madin, Canton, and Yash Andrew Imai, Troy, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Oct. 18, 2000, Appl. No. 691,666
This patent is subject to a terminal disclaimer.
Int. Cl. F02B *75/04*
U.S. Cl. 123—48 B **14 Claims**



1. An apparatus for selectively varying a compression ratio of an internal combustion engine, the engine having a cylinder, a reciprocating piston disposed within the cylinder, a crankshaft having a crankpin, and a connecting rod coupled to the crankpin and the piston, said apparatus comprising a bearing retainer disposed between the connecting rod and the crankpin, the bearing retainer having an inner surface in communication with the crankpin and an outer surface in communication with the connecting rod, the connecting rod being axially movable relative to the bearing retainer along a longitudinal axis of the connecting rod to effect a selective displacement of the connecting rod relative to the bearing retainer, the displacement thereby causing a change in the effective length of the connecting rod and the compression ratio of the internal combustion engine.

US 6,408,805 B2

TWO-STROKE CYCLE ENGINE

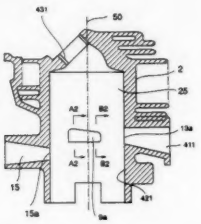
Kazuyuki Uenoyama; Yoshio Kobayashi, and Kazunori Kudou, all of Nagoya, Japan, assignors to Mitsubishi Heavy Industries, Ltd., Tokyo, Japan

Division of application No. 09/558,596, filed on Apr. 26, 2000. This application Apr. 12, 2001, Appl. No. 832,802.

Claims priority, application Japan, Apr. 28, 1999, 11-122599; Dec. 16, 1999, 11-357099; Dec. 27, 1999, 11-371683; Dec. 27, 1999, 11-371684; Dec. 28, 1999, 11-375130; Jan. 7, 2000, 2000-1316

Int. Cl. F01P *7/04*

U.S. Cl. 123—73 PP **2 Claims**



1. A two-stroke cycle engine, comprising:

an exhaust port on the sidewall of the cylinder, which opens into the cylinder;

a scavenging port on the sidewall of the cylinder positioned a slight distance apart in the circumferential direction from said exhaust port, which also opens into the cylinder;

an intake port, which opens to supply fuel-air mixture to the crankcase according to the action of the piston; and

a scavenger passage, which connects the crankcase and said scavenging port;

wherein a blow-up angle (α) of said scavenger passage, which is defined by an angle between the upper wall which connects to said scavenging port and a perpendicular line to the axis of the cylinder, varies along the circumferential direction of the cylinder, and if said blow-up angle in a location nearer said exhaust port is defined as ($\alpha 1$) and said blow-up angle in a location nearer said intake port is defined as ($\alpha 2$), then $\alpha 1 < \alpha 2$.

US 6,408,806 B2

VARIABLE VALVE OPERATING SYSTEM OF INTERNAL COMBUSTION ENGINE ENABLING VARIATION OF WORKING ANGLE AND PHASE

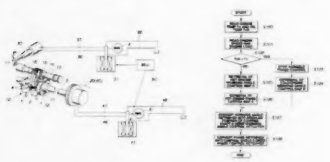
Takanobu Sugiyama, and Tsuneyasu Nohara, both of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 6, 2001, Appl. No. 874,052

Claims priority, application Japan, Jun. 12, 2000, 2000-174733

Int. Cl. F01L *1/34*

U.S. Cl. 123—90.15 **15 Claims**



1. A valve operating system of an internal combustion engine enabling both valve working angle and phase to be varied, the valve operating system comprising:

a working angle control mechanism which variably controls a working angle of an intake valve;

a first actuator which drives the working angle control mechanism in response to a supply pressure of working fluid;

a phase control mechanism which variably controls a phase of the working angle of the intake valve;

a second actuator which drives the phase control mechanism in response to a supply pressure of working fluid;

a temperature sensor which detects a temperature of the working fluid;

a control section which controls the supply pressure to each of the first and second actuators; and

the control section limiting a controlled variable of at least one of the working angle control mechanism and the phase control mechanism in a cold-engine state in which the temperature of the working fluid is less than a predetermined temperature value, as compared to a hot-engine state in which the temperature of the working fluid is greater than or equal to the predetermined temperature value.

US 6,408,807 B1

VARIABLE VALVE TIMING SYSTEM

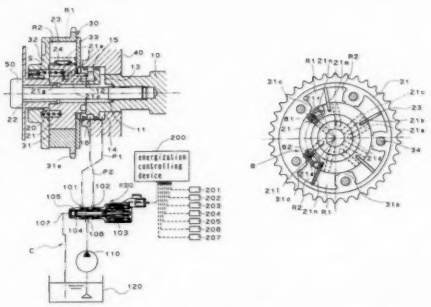
Osamu Komazawa, Chita; Kazumi Ogawa, Toyota, and Yoji Kanada, Gamagori, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 3, 2001, Appl. No. 920,646

Claims priority, application Japan, Aug. 3, 2000, 2000-236010; May 25, 2001, 2001-157080

Int. Cl. F01L *1/34*

U.S. Cl. 123—90.17 **14 Claims**



1. A variable valve timing system comprising:

a housing member provided in a driving force transmitting system in which is transmitted a driving force from a crankshaft of an internal combustion engine to a camshaft for controlling opening/closing of one of an intake valve and an exhaust valve of the internal combustion engine;

the housing member rotating together with one of the crankshaft and the camshaft;

a rotor member relatively rotatably assembled on a shoe portion provided on the housing member and forming an advanced angle chamber and a retarded angle chamber at a vane portion in the housing member;

the rotor member rotating together with the other of the camshaft and the crankshaft;

a relative rotation controlling mechanism which, upon unlock operation established by being supplied with an operation fluid, allows relative rotation between the housing member and the rotor member and which, upon lock operation established by discharge of the operation fluid, restricts the relative rotation between the housing member and the rotor member at a lock phase position in an intermediate region located at a position other than rotation limit ends corresponding to advanced and retarded angle phase positions, respectively; and

a hydraulic pressure circuit for controlling the operation fluid supply and discharge for the relative rotation controlling mechanism as well as for controlling the operation fluid

supply and discharge of each of the advanced angle chamber and the retarded angle chamber;

the hydraulic pressure circuit, upon initiation of the internal combustion engine, discharging the operation fluid from the relative rotation controlling mechanism and the advanced and retarded angle chambers until a pressure of the operation fluid reaches a controllable pressure value;

the hydraulic pressure circuit being adapted, after the pressure of the operation fluid reaches the controllable pressure value, to effect filling of one of the advanced and retarded angle chambers which is at a superior side of in phase transfer response characteristics with the operation fluid, and to subsequently effect filling of the other of the advanced and retarded angle chambers with operation fluid, the hydraulic pressure circuit being adapted to supply the operation fluid to the relative rotation controlling mechanism.

US 6,408,808 B1

DOHC DIESEL ENGINE CYLINDER HEAD

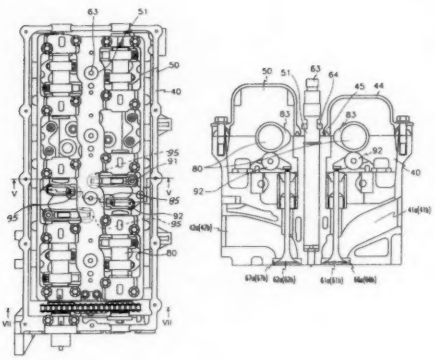
Se-Young Yi, Yongin, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Jul. 3, 2000, Appl. No. 609,130

Claims priority, application Rep. of Korea, Oct. 18, 1999, 99-45079

Int. Cl. F01L *1/02*

U.S. Cl. 123—90.27 **15 Claims**



1. A DOHC diesel engine cylinder head comprising:

a plurality of combustion chamber head sections having the same configuration;

two camshafts rotationally mounted over the combustion chamber head sections, each having cam lobes for activating intake and exhaust valves;

a chain coupling said two camshafts for driving the camshafts;

a camshaft carrier mounted on a top surface of the cylinder head for supporting the camshafts, the camshaft carrier having an injector receiving opening;

a valve cover for covering the cylinder head, the valve cover having an injector insertion opening;

a fuel injector inserted in the injector receiving opening; and

a clamp clamping the fuel injector to the engine head, wherein the fuel injector can be inserted into the injector receiving opening through the injector insertion opening and clamped onto the head with the clamp without removing the valve cover, and wherein the fuel injector can be unclamped and removed from the head without removing the valve cover.

US 6,408,809 B2

INTAKE CONTROL DEVICE FOR MULTI-CYLINDER V-TYPE ENGINE

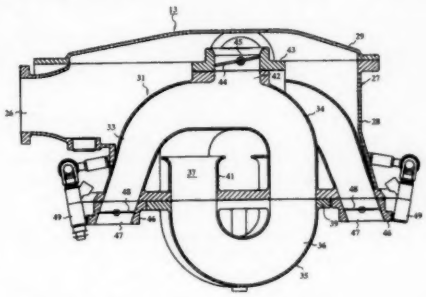
Minoru Suzuki, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 26, 2001, Appl. No. 681,372

Claims priority, application Japan, Apr. 17, 2000, 2000-114932

Int. Cl. F02B *75/22;27/02;31/00*

U.S. Cl. 123—184.31 **27 Claims**



1. A V-type, multi-cylinder, internal combustion engine comprised of a cylinder head, cylinder block arrangement consisting of a pair of angularly disposed cylinder banks with intake ports disposed adjacent a valley defined between said cylinder banks, and an induction system for delivering at least an air charge to said intake ports, said induction system being comprised of a single surge tank disposed in substantial part in said valley and having an air inlet through which an air charge is delivered to said surge tank, a plurality of curvilinear intake pipes, each extending from a respective of said intake ports into said surge tank, each of said curvilinear intake pipes having a low speed inlet opening in said surge tank at its end remote from the served intake port and a valved high speed inlet opening in said surge tank spaced a lesser distance from the served intake port to provide a substantially lesser flow length from said surge tank to the served intake port when said valved high speed inlet opening is opened, at least said valved high speed inlet opening facing away from said valley into said surge tank.

US 6,408,810 B1

AIR INTAKE DEVICE

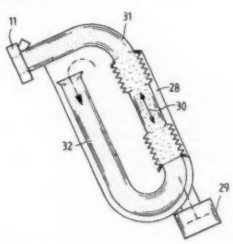
Rudolf Leipelt, Hessigheim, and Olaf Weber, Friolzheim, both of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany

Filed Oct. 23, 2000, Appl. No. 693,907

Claims priority, application Germany, Oct. 23, 1999, 199 51 083

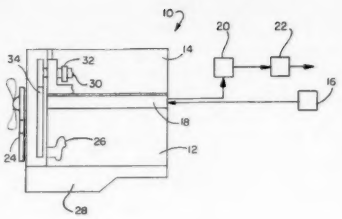
Int. Cl. F02M *35/10*

U.S. Cl. 123—184.55 **10 Claims**



1. An air intake device for an internal combustion engine, said device comprising at least one collection manifold and a plurality of intake tubes which branch separately from the collection mani-

fold to individual cylinders of the internal combustion engine, wherein each of the intake tubes extends to the collection manifold and is formed at least partially by an adjustable element, wherein said intake tubes each comprise a plurality of segments at least one of which is independently moveable relative to at least one other segment, wherein each intake tube comprises successive first, second and third elements which can be coupled together at coupling points, wherein the first element is a stiff element, the second element is a rotatable or longitudinally displaceable element, and the third element is a stiff element, and wherein the rotatable or longitudinally displaceable second element comprises variable-length portions at the coupling points.



US 6,408,811 B1

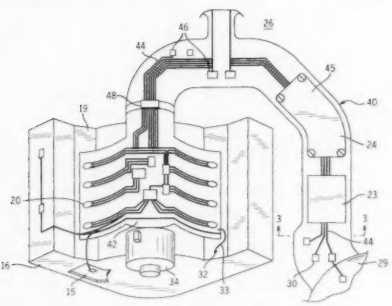
VEHICLE ENGINE COMPONENTS PROVIDING INTEGRAL INTERCONNECT CIRCUITRY SYSTEM

Andrew Zachary Glovatsky, Plymouth; Jay DeAvis Baker, Dearborn, and Myron Lemecha, Dearborn Heights, all of Mich., assignors to Visteon Global Technologies, Inc., Dearborn, Mich.

Provisional application No. 60/130,860, filed on Apr. 22, 1999. This application Apr. 18, 2000, Appl. No. 551,371.

Int. Cl. F02P *23/00*

U.S. Cl. 123—184.61 **26 Claims**



1. An interconnect circuitry system for use with a vehicle engine having control electronics communicating with engine mounted control devices, the interconnect circuitry system comprising:

at least one structural engine component which when assembled to an engine presents a dimension spanning a distance between the control electronics and at least one of the engine mounted control devices;

electrical conductors attached integrally to the structural engine component to be supported and guided thereby along the dimension, wherein the electrical conductors are attached to a surface of the structural engine component;

whereby assembly of the structural engine component to the engine also provides interconnection between the control electronics and the engine mounted control devices.

US 6,408,812 B1

METHOD OF OPERATING SPARK-IGNITION FOUR-STROKE INTERNAL COMBUSTION ENGINE

William Bricker Chamberlin, III, Kirtland; John Kent Pudelski, Cleveland Heights, and George Steven Szappanos, Mentor, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Sep. 19, 2000, Appl. No. 664,834

Int. Cl. F01L *9/02*

U.S. Cl. 123—196 R **33 Claims**

1. A method of operating a spark ignition four-stroke internal combustion engine comprised of a valve train and a crankcase and equipped with an exhaust gas aftertreatment device, said method comprising:

(A) operating said engine using a gasoline fuel composition, the exhaust gas from the operation of said engine being advanced through said aftertreatment device;

(B) lubricating said crankcase using a first lubricating oil composition, said first lubricating oil composition being characterized by the absence of extreme-pressure additives comprised of metal and phosphorus;

(C) lubricating said valve train using a second lubricating oil composition;

(D) removing part of said first lubricating oil composition from said crankcase, said removed part of said first lubricating oil composition (i) being combined with said gasoline fuel composition and consumed with said gasoline fuel composition as said engine is operated or (ii) being combined with the exhaust gas from said engine and removed from said engine with said exhaust gas; and

(E) adding an additional amount of said first lubricating oil composition to said crankcase to replace said removed part of said first lubricating oil composition.

US 6,408,813 B1

PISTON AND CONNECTING ROD RETENTION

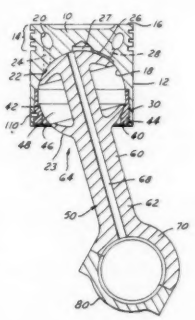
Mark Conrad Wilksch, Buckingham Bucks; Martin Geoffrey Long, Northants, and Philip Clive Franklin, Bicester, all of United Kingdom, assignors to Seneca Technology, Ltd., Turks & Caicos Islands, Turks/Caicos Islands

Filed Apr. 19, 2000, Appl. No. 552,270

Claims priority, application United Kingdom, Apr. 19, 1999, 9908844

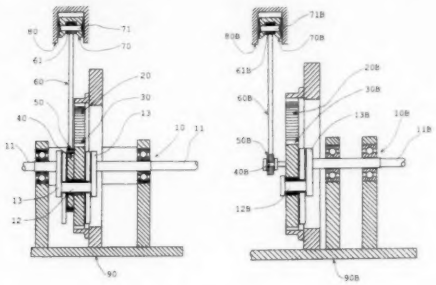
Int. Cl. F16J *1/14*

U.S. Cl. 123—197.3 **14 Claims**



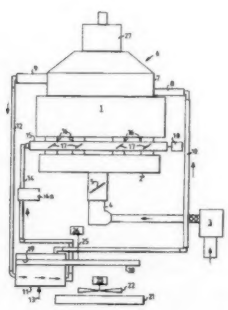
1. A piston assembly comprising a piston body, a connecting rod having a small end and a big end, and a unitary piston retaining ring, said retaining ring being installed within said piston body for retaining said connecting rod small end therein, said retaining ring being a closed one-piece ring and having a profiled opening with a pair of opposed notches in order to fit over said big end of said connecting rod during installation.

US 6,408,814 B2
FOUR-CYCLE INTERNAL COMBUSTION ENGINE
Yoshiharu Shigemori, 2-26, Habikino 6-chome, Habikino-shi, Osaka-fu, Japan
Filed Dec. 7, 1999, Appl. No. 456,965
Int. Cl. F02B *75/32*
U.S. Cl. 123—197.4 **3 Claims**



1. A four-cycle internal combustion engine having a piston reciprocably movable within a cylinder, a crankshaft, a rod connecting the piston to the crankshaft and means arranged between the rod and the crankshaft to vary the stroke of the piston, said means for varying the stroke comprising an internal gear fixed on the frame of the engine, an external gear engaged with the internal gear as rotatably supported on the crankpin of the crankshaft and an eccentric member fixed eccentrically to the crankpin on the external gear, characterized in that the eccentiric distance of the crankpin, the radius of the pitch circle of the external gear and the radius of the pitch circle of the internal gear are in the ratio of one to two to three.

US 6,408,815 B2
INTERNAL COMBUSTION ENGINE INSTALLATION IN A MOTOR VEHICLE
Jan Karlsson, Västra Frölunda, Sweden, assignor to Volvo Car Corporation, Sweden
Filed May 23, 2001, Appl. No. 681,701
Claims priority, application Sweden, May 23, 2000, 0001920
Int. Cl. F02M *25/08*
U.S. Cl. 123—198 R **9 Claims**



1. An internal combustion engine installation in a motor vehicle having an internal combustion engine arranged in an engine compartment, said engine having an air intake conduit that opens to an intake manifold, and an exhaust manifold which opens to an exhaust conduit, comprising:

a hydrocarbon-absorbing element, and

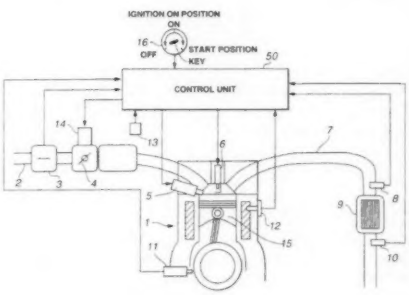
a heating device for heating and removal of hydrocarbon from said hydrocarbon-absorbing element,

wherein said heating device is an element heated by the engine exhaust,

wherein said hydrocarbon-absorbing element of said heating device are so arranged in said engine compartment relative to each other that a portion of said hydrocarbon-absorbing element is exposed to the surrounding engine compartment when another portion of said element is exposed to said heating device, and

wherein said hydrocarbon-absorbing element is movable such that a portion of said element moves to said heating device at the same time as another portion moves away from said heating device.

US 6,408,816 B1
CONTROL APPARATUS AND METHOD FOR DIRECT-INJECTION SPARK-IGNITION INTERNAL COMBUSTION ENGINE
Masayuki Tomita, Milton Keynes Bucks, United Kingdom, and Kimiyoshi Nishizawa, Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Sep. 8, 2000, Appl. No. 658,661
Claims priority, application Japan, Sep. 9, 1999, 11-255648
Int. Cl. F02B *17/00*
U.S. Cl. 123—295 **18 Claims**



1. A control apparatus for a direct-injection spark-ignition internal combustion engine, comprising:

a first controlling section that performs a stratified combustion to raise an exhaust temperature under a condition prior to a completion of an engine warm-up, the stratified combustion being provided with a lean air-fuel mixture formed over a whole combustion chamber through a fuel injection at a suction stroke and a rich air-fuel mixture formed in an inner space surrounding a spark plug of the combustion chamber through a fuel injection at a compression stroke; and

a second controlling section that corrects a fuel injection quantity of the fuel injection at the suction stroke and a fuel injection quantity of the fuel injection at the compression stroke by use of a feedback correction coefficient so that an average air-fuel ratio over the whole combustion chamber is controlled to be a predetermined target air-fuel ratio, wherein one of the fuel injections whose fuel injection quantity is larger than the other fuel injection is corrected in both increase and decrease directions by use of the feedback correction coefficient, and wherein the other fuel injection is corrected only in an increase direction by use of the feedback correction coefficient.

US 6,408,817 B2

THROTTLE BODY FOR AN INTERNAL COMBUSTION ENGINE AND ITS MANUFACTURING METHOD AND A THROTTLE APPARATUS USING THE SAME

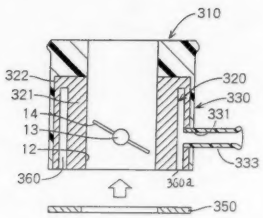
Katsuya Torii, and Yuichiro Miura, both of Anjo, Japan, assignors to Denso Corporation, Kariya, Japan

Filed Feb. 13, 2001, Appl. No. 781,193

Claims priority, application Japan, Feb. 16, 2000, 2000-37954; Mar. 29, 2000, 2000-90651; Oct. 31, 2000, 2000-333043

Int. Cl. F02D *9/08*

U.S. Cl. 123—337 **12 Claims**



1. A throttle body for an internal combustion engine which adjusts an air amount flowing in an air passage formed therein, comprising:

an inner cylinder having an inside space serving as said air passage therein;

a valve member provided in said inside space of said inner cylinder to control an opening degree of said air passage;

an outer cylinder formed integrally with said inner cylinder and disposed outside said inner cylinder;

a heating medium passage disposed between said inner cylinder and said outer cylinder and having an annular opening at one axial end side of said throttle body;

holes extending across a wall of said outer cylinder and communicating with said heating medium passage; and

a sealing member for sealing said annular opening of said heating medium passage.

US 6,408,818 B1

INTAKE AIR FLOW RATE CONTROLLING DEVICE

Tsubakiji Tadashi, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 2000, Appl. No. 660,485

Claims priority, application Japan, May 23, 2000, 2000-151644

Int. Cl. F02D *11/10*

U.S. Cl. 123—399 **3 Claims**

1. An intake air flow rate controlling device, comprising:

a throttle valve located in an intake passage of a combustion engine;

a motor that controls an intake air flow rate by controlling an opening degree of the throttle valve;

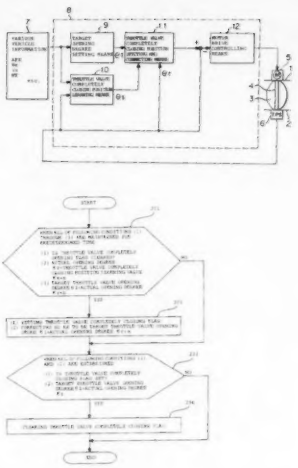
a motor driving means for driving the motor;

a throttle valve opening degree detecting sensor;

a target opening degree setting means for outputting a target throttle valve opening degree as a target position signal to the motor driving means for setting the opening degree of the throttle valve;

a throttle valve completely closing position learning means for learning a completely closed position of the throttle valve from a completely closed position signal from the throttle valve opening degree detecting sensor, and for outputting a corresponding closed position learning value; and

a throttle valve completely closing position detecting and correcting means for detecting a stop of an operation of the combustion engine, for operating the throttle valve to be in a completely closed position, for detecting the completely closed position from the completely closed position signal from the throttle valve opening degree detecing sensor, and



for correcting the target position signal, for a completely closed state, outputted from the target opening degree setting means by shifting the target position signal on a side of opening the throttle valve by a predetermined amount.

US 6,408,819 B1

METHOD FOR CONTROLLING AND REGULATING COMBUSTION IN THE COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Manfred Mezger, Markgroeningen, and Hubert Bischof, Vaihingen/Enz, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

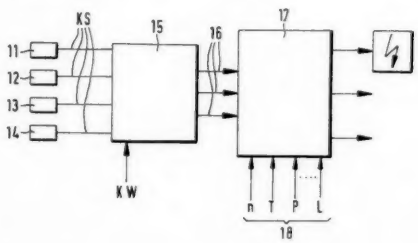
PCT No. PCT/DE98/02471, § 371 Date Mar. 6, 2000, § 102(e) Date Mar. 6, 2000, PCT Pub. No. WO99/13217, PCT Pub. Date Mar. 18, 1999

PCT Filed Aug. 24, 1998, Appl. No. 508,070

Claims priority, application Germany, Sep. 6, 1997, 197 39 085

Int. Cl. F02P *5/00*

U.S. Cl. 123—406.29 **5 Claims**



1. A method for controlling a combustion in-a combustion chamber of an internal combustion engine, comprising the steps of:

detecting, with at least one knock sensor, a cylinder-specific knocking signal for each cylinder of the internal combustion engine;

transmitting the detected knocking signal to an evaluation circuit;

reconstructing, in the evaluation circuit, a combustion chamber pressure characteristic as a function of the detected knocking signal; and

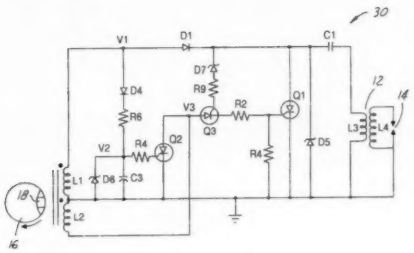
evaluating the reconstructed combustion chamber pressure characteristic for controlling a next combustion in the cylinder.

US 6,408,820 B1

CAPACITOR DISCHARGE ENGINE IGNITION SYSTEM WITH AUTOMATIC IGNITION ADVANCE AND/OR MINIMUM IGNITION SPEED CONTROL

Gerald L. LaMarr, Jr., Bay City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Aug. 2, 2000, Appl. No. 631,005
Int. Cl. F02P *5/145*
U.S. Cl. 123—406.57 **6 Claims**



1. A capacitor discharge engine ignition system that includes:

ignition coil means having a primary winding and a secondary winding for coupling to. engine ignition means,

an ignition charge storage capacitor coupled to said primary winding,

first electronic switch means having primary current conducting electrodes in circuit with said ignition charge storage capacitor and said primary winding, and a control electrode responsive to trigger signals for operatively connecting said ignition charge storage capacitor to discharge through said primary winding,

charge/trigger coil means for generating periodic signals in synchronism with operation of the engine, including charge coil means for generating a charge signal to charge said ignition charge storage capacitor and trigger coil means for generating said trigger signal,

means for controlling timing of said trigger signal as a function of engine speed comprising second electronic switch means including an SCR having a gate electrode, and an anode and cathode operatively connected to said control electrode of said first electronic switch-means, and an RC circuit, including a resistor and a second capacitor, operatively connecting said charge coil to said gate electrode of said SCR to prevent application of said trigger signal to said control electrode of said first electronic switch means as a function of engine speed,

said means for controlling timing of said trigger signal comprising means for advancing timing of said trigger signal as a function of increasing engine speed, suppression of said trigger signal during occurrence of said charge signal automatically advancing occurrence of said trigger signal following occurrence of said charge signal, and

third electronic switch means having primary current conducting electrodes operatively connected between said trigger coil means and said control electrode of said first electronic switch means, and a control electrode operatively coup led to said ignition charge storage capacitor.

US 6,408,821 B1

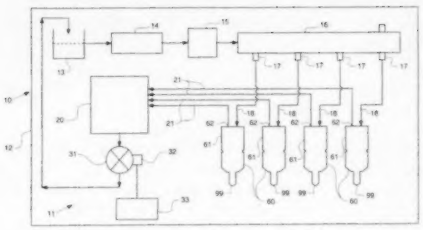
FUEL INJECTION SYSTEM WITH COMMON ACTUATION DEVICE AND ENGINE USING SAME

Chetan J. Desai, and Xinshuang Nan, both of Bloomington, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 19, 2000, Appl. No. 740,533
Int. Cl. F02M *47/02*
U.S. Cl. 123—446 **20 Claims**

1. An engine comprising:

an engine housing;



a high pressure fuel rail;

a low pressure fuel drain;

a fuel injection system including a plurality of fuel injectors positioned in said engine housing and fluidly connected to said fuel rail;

each of said plurality of fuel injectors including an injector body defining a nozzle outlet and a nozzle supply passage, and including a needle valve member movably positioned in said injector body adjacent said nozzle outlet;

a fluid switch having a plurality of positions;

an electronically controlled valve being positioned remote from said plurality of fuel injectors and fluidly between said fluid switch and said fuel drain; and

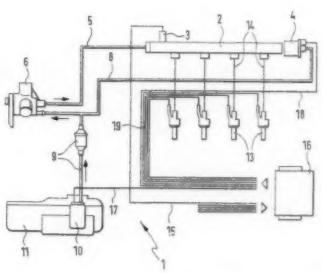
a different one of said plurality of fuel injectors being fluidly connected to said electronically controlled valve at each of said plurality of positions.

US 6,408,822 B1

FUEL SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE ESPECIALLY OF A MOTOR VEHICLE

Helmut Rembold, Stuttgart; Ferdinand Grob, Besigheim; Hartmut Bauer, Gerlingen; Uwe Maienberg, Leonberg, and Klaus Scherrbacher, Schwieberdingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE00/00230, § 371 Date Oct. 10, 2000, § 102(e) Date Oct. 10, 2000, PCT Pub. No. WO00/45037, PCT Pub. Date Aug. 3, 2000
PCT Filed Jan. 27, 2000, Appl. No. 647,243
Claims priority, application Germany, Jan. 28, 1999, 199 03 273
Int. Cl. F02M *37/04*
U.S. Cl. 123—447 **6 Claims**



1. A method for operating a fuel supply system for an internal combustion engine when starting the engine, the engine including an engine of a motor vehicle, the fuel system including an accumulator, a pump and a pressure control valve, and the method comprising the steps of:

pumping fuel into said accumulator with said pump;

controlling the pressure in said accumulator with said pressure control valve;

closing said pressure control valve when said engine is to be started but no rotational movement is yet present; and,

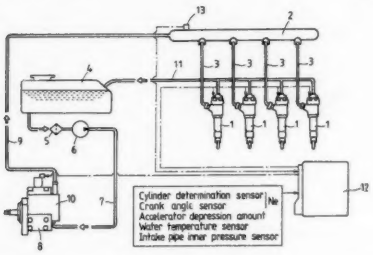
controlling said pressure control valve in correspondence to a normal operation when a pregiven rpm limit (NG) is exceeded.

US 6,408,823 B1

FUEL INJECTION CONTROL DEVICE FOR ENGINES

Susumu Takahashi, and Masaaki Nishitou, both of Kanagawa, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Aug. 25, 1998, Appl. No. 139,659
Claims priority, application Japan, Aug. 29, 1997, 9-247525
Int. Cl. F02M *41/00*
U.S. Cl. 123—456 **4 Claims**



1. A fuel injection control device for engines comprising:

a common rail to store fuel delivered by a fuel pump;

injectors to inject fuel supplied from the common rail into combustion chambers;

a pressure sensor to detect a pressure of the common rail; and

a controller to control the amount of fuel delivered from the fuel pump according to the pressure of the common rail detected by the pressure sensor;

wherein the fuel pump has pump chambers that are successively activated to deliver fuel each time the injectors have injected fuel;

wherein, based on the difference between the common rail recovery pressures provided by the fuel delivered from two successively operated pump chambers of the fuel pump, the controller controls the amount of fuel delivered by the second-operated of the two pump chambers in order to minimize variations of the common rail pressure.

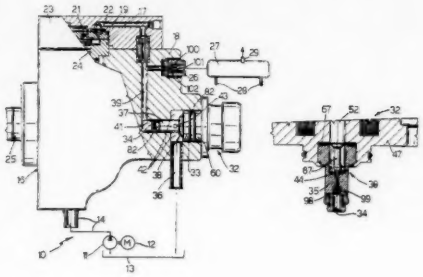
US 6,408,824 B1

DEVICE FOR REGULATING THE DELIVERY PRESSURE OF A PUMP, FOR EXAMPLE, FOR FEEDING FUEL TO AN INTERNAL COMBUSTION ENGINE

Nicola Pacucci, Bari, and Sisto Luigi De Matthaeis, Modugno, both of Italy, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jun. 30, 2000, Appl. No. 607,244
Claims priority, application Italy, Jul. 2, 1999, TO99A0571
Int. Cl. F02M *37/04*
U.S. Cl. 123—467 **18 Claims**

1. A device for regulating a delivery pressure of a pump for feeding fuel to an internal combustion engine, the device comprising a solenoid valve having a supply conduit communicating with a delivery conduit of said pump, a drain conduit, a shutter between said supply conduit and said drain conduit, an electromagnet energized variably to control an armature controlling said shutter, a cutoff chamber for cutting off hydraulic pressure between said supply conduit and said drain conduit, said cutoff chamber being of such a volume as to reduce variation in said hydraulic pressure on said armature, wherein said armature comprises a cylindrical stem having a portion housed in said cutoff chamber and connected to said stem by a shoulder, said portion having a diameter smaller than a diameter of said stem to increase the volume of said cutoff chamber, and a fixed shield defining said cutoff chamber and having an opening in which said portion slides so as to eliminate a piston effect of the hydraulic pressure in said chamber on said stem.

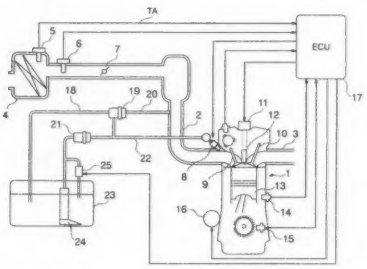


US 6,408,825 B1

FUEL INJECTION CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Keiichi Enoki; Tadahiro Azuma, both of Tokyo, and Takeshi Kakigi, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 2001, Appl. No. 985,854
Claims priority, application Japan, Apr. 19, 2001, 13-120996
Int. Cl. F02M *41/00*
U.S. Cl. 123—467 **6 Claims**



1. A fuel injection control apparatus for an internal combustion engine, comprising:

various types of sensors for detecting operation states of an internal combustion engine;

a fuel pump and a fuel supply pipe for supplying a fuel from a fuel tank to said internal combustion engine;

a fuel injector for injecting the fuel into said engine;

engine stoppage detecting means for detecting a stopped state of said engine;

fuel temperature estimating means for estimating temperature of the fuel within said fuel supply pipe; and

fuel pressure lowering means for lowering pressure of the fuel within said fuel supply pipe;

wherein said fuel pressure lowering means is so designed as to lower pressure of the fuel within said fuel supply pipe after the stoppage of operation of said engine in dependence on an estimated fuel temperature determined by said fuel temperature estimating means.

US 6,408,826 B2

COMMON RAIL AND METHOD OF MANUFACTURING THE SAME

Kikuo Asada, Mishima; Masayoshi Usui, Numazu; Eiji Watanabe, Tagata-gun; Kazunori Takikawa, Numazu, and Ryuichi Kusanagi, Numazu, all of Japan, assignors to Usui Kokusai Sangyo Kaisha Limited, Japan

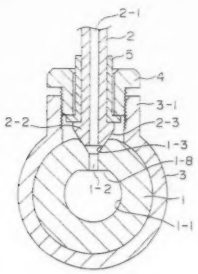
Filed Mar. 20, 1998, Appl. No. 33,541

Claims priority, application Japan, Mar. 3, 1997, 9-063845

This patent is subject to a terminal disclaimer.

Int. Cl. F02M *55/02*

U.S. Cl. 123—468 **4 Claims**



1. An elongate common rail having a peripheral wall, said peripheral wall having an outer surface extending along the common rail and a communication passage extending longitudinally through the common rail, the communication passage defining an inner peripheral surface, at least one branch hole extending through the peripheral wall from the outer surface to the inner peripheral surface, portions of said branch hole adjacent said outer surface being outwardly flared and defining a pressure-receiving seat surface for communication with a branch pipe, portions of said inner peripheral surface at locations spaced from said branch hole being substantially cylindrical, portions of said inner peripheral surface of said peripheral wall of said common rail adjacent and surrounding said branch hole being deformed to define a non-cylindrical surface region surrounding said branch hole with a compression residual stress existing in said common rail adjacent the portions of said inner peripheral surface surrounding said branch hole for improving internal pressure fatigue strength.

US 6,408,827 B1

STAMPED FUEL RAIL WITH INTEGRATED MOUNTING BRACKETS

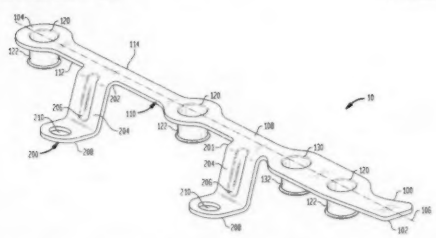
Joseph Edward Scollard, Suffolk; James Russell Morris, Newport News; Jeffery Ersin Brittle, Williamsburg, and Dean Leigh Spiers, Yorktown, all of Va., assignors to Siemens Automotive Corporation, Auburn Hills, Mich.

Provisional application No. 60/165,390, filed on Nov. 12, 1999.

This application Jun. 30, 2000, Appl. No. 606,538.

Int. Cl. F02M *55/02*

U.S. Cl. 123—470 **4 Claims**



1. An integrated fuel rail portion and mounting bracket assembly comprising:

an elongated support portion; and

at least one mounting bracket integrally connected to the elongated support portion, wherein each of the at least one mounting bracket includes a structural stiffener formed into the mounting bracket.

US 6,408,828 B1

REDUNDANT INDUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

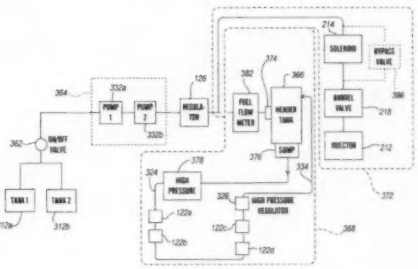
J. Lance Wheeler, Arlington, Wash., assignor to W.G.A. Holdings Ltd., Tortola, Virgin Islands (Br.)

Provisional application No. 60/142,859, filed on Jul. 7, 1999.

This application Jul. 7, 2000, Appl. No. 611,779.

Int. Cl. F02D *41/22*

U.S. Cl. 123—479 **2 Claims**



1. A redundant fuel system for use in conjunction with a primary fuel system, the primary system including an air manifold coupled to engine cylinders and to a central plenum, the primary system providing separate fuel injectors for each cylinder during normal operation of the primary fuel system, the secondary system comprising:

fuel input device for delivering fuel to said plenum;

a control for preventing flow of fuel to said fuel input device during normal operation of said primary fuel system, said control comprising a solenoid; and

a flow rate control valve positioned between said solenoid and said fuel input device, said flow rate control valve comprising a barrel valve.

US 6,408,829 B1

FUEL PRESSURE DELAY CYLINDER

Ning Lei, Oak Brook; Xilin Yang, Elk Grove Village; James H. Yager, St. Charles; Puning Wei, Lisle, and Mark J. Glodowski, Wheeling, all of Ill., assignors to International Engine Intellectual Property Company, L.L.C., Warrenville, Ill.

Provisional application No. 60/129,999, filed on Apr. 19, 1999.

This application Apr. 19, 2000, Appl. No. 552,737.

Int. Cl. F02M *37/04*

U.S. Cl. 123—501 **62 Claims**

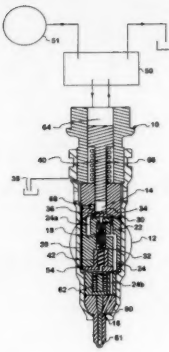
1. A fuel injector, comprising:

an electric controller for controlling the flow of a high pressure actuating fluid responsive to initiation and cessation of a pulse width command, the pulse width command defining the duration of an injection event;

an intensifier being in fluid communication with the controller, the intensifier being translatable to increase the pressure of a volume of fuel in a plunger chamber for injection into the combustion chamber of an engine, the intensifier having an intensifier piston disposed in a cylinder defined in an injector housing;

an injector nozzle in fluid communication with the intensifier;

a delay device in fluid communication with the intensifier and the injector nozzle, being shiftable between a first disposition



and a second disposition over a certain period of time after initiation of the pulse width command, the period of time effecting a delay in initiation of at least a portion of the fuel injection from the injector nozzle after initiation of the pulse width command, the delay device including a delay piston translationally disposed in a delay piston cylinder defined at least in part in the injector housing, actuation of the delay device being effected by a flow of selectively throttled pressurized fuel.

US 6,408,830 B1

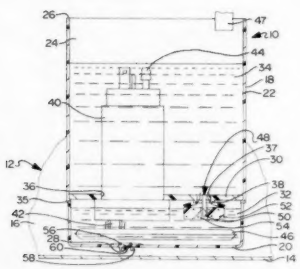
FUEL PUMP MODULE FOR A FUEL TANK

Dennis Paul McGrath, Ortonville, Mich., assignor to Delphi Technologies, Inc., Troy, Mich.

Filed Dec. 15, 2000, Appl. No. 746,544

Int. Cl. F02M *37/10*

U.S. Cl. 123—509 **20 Claims**



1. A fuel pump module for a fuel tank in a vehicle comprising:

a reservoir adapted to be disposed in the fuel tank;

a partition disposed in said reservoir to divide said reservoir into a fuel sensing chamber and a fuel storage chamber;

a conduit conducting return fuel from an engine of the vehicle to said fuel storage chamber of said reservoir;

a fuel pump disposed in said reservoir and having an inlet disposed in said fuel sensing chamber and an outlet disposed in said fuel storage chamber; and

a fuel usage priority valve to allow fuel from said fuel storage chamber to flow to said fuel sensing chamber to provide said inlet of said fuel pump with fuel from said fuel storage chamber.

US 6,408,831 B1

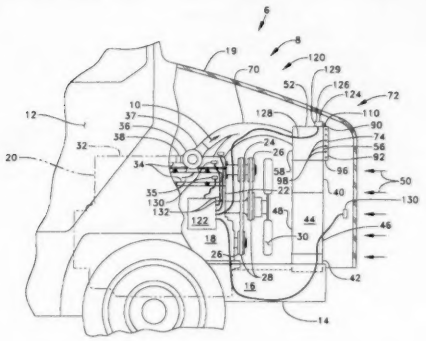
SYSTEM FOR CONTROLLING THE TEMPERATURE OF AN INTAKE AIR

Mark W. Craig, Mossville, Ill.; Eric D. Hardin, Bellevue, Wash., and Tony G. Kertz, East Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 20, 2000, Appl. No. 742,701

Int. Cl. F02M *21/04*

U.S. Cl. 123—542 **20 Claims**



1. A system for controlling the temperature of an intake air flow used to support combustion in an engine, said system comprising:

an exhaust gas having a portion thereof circulated to said intake air flow;

an air to air aftercooler having said intake air flow being a donor fluid;

an ambient air flow acting as a recipient fluid for cooling said intake air flow and passing through said aftercooler;

a plurality of sensors being operatively-positioned in said ambient air flow and said intake air flow;

a controller being operatively connected to said plurality of sensors;

one of an ambient air flow restriction system having a restriction device and an intake air flow restriction system having a restriction device; and

said controller defining a position of said restriction device between an open position and a closed position.

US 6,408,832 B1

OUTBOARD MOTOR WITH A CHARGE AIR COOLER

Erik J. Christiansen, West Bend, Wis., assignor to Brunswick Corporation, Lake Forest, Ill.

Continuation-in-part of application No. 09/817,395, filed on Mar. 26, 2001. This application Sep. 28, 2001, Appl. No. 966,017.

Int. Cl. F02B *33/00*

U.S. Cl. 123—563 **14 Claims**

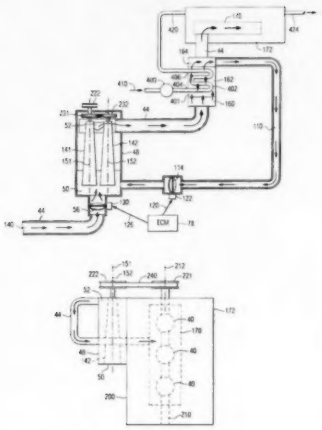
1. An outboard motor, comprising:

an internal combustion engine having a plurality of cylinders, each of said plurality of cylinders each having one of a plurality of pistons slidably disposed therein for reciprocal movement;

a crankshaft driven by said plurality of pistons of said engine and supported within said engine for rotation about a vertical axis;

a supercharger having an inlet passage and an outlet passage, said supercharger being a screw compressor comprising a first screw rotor rotatable about a first rotor axis and a second screw rotor rotatable about a second rotor axis, said first and second rotor axes being parallel to said vertical axis, said screw compressor being connected in torque transmitting relation with said crankshaft;

a propulsor connected in torque transmitting relation with said crankshaft;



an air conduit connected in fluid communication with said plurality of cylinders to direct a flow of charge air from said supercharger to said plurality of cylinders, said outlet passage being connected in fluid communication with said air conduit;

a heat exchanger disposed in fluid communication with said air conduit between said supercharger and said plurality of cylinders and in thermal communication with said flow of charge air to reduce the temperature of said charge air prior to said flow of charge air entering said plurality of cylinders;

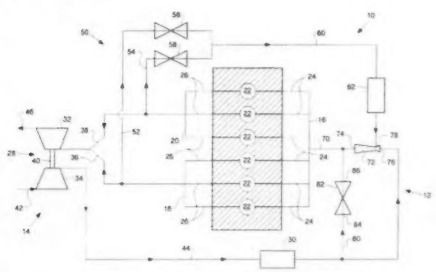
a bypass conduit disposed in fluid communication between said air conduit and said inlet passage of said supercharger; and

a bypass valve disposed within said bypass conduit to control the flow of air from said outlet passage to said inlet passage, said bypass conduit is disposed in fluid communication between said first conduit of said heat exchanger and said inlet passage of said supercharger.

US 6,408,833 B1
VENTURI BYPASS EXHAUST GAS RECIRCULATION SYSTEM

James J. Faletti, Spring Valley, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 7, 2000, Appl. No. 732,470
Int. Cl. F02M *25/07*
U.S. Cl. 123—568.17 **20 Claims**



1. An internal combustion engine, comprising:

a combustion air supply;

an exhaust manifold;

an intake manifold;

a venturi assembly including an outlet connected and in communication with said intake manifold, a combustion air inlet connected and in communication with said combustion air supply, and an exhaust gas inlet connected and in communication with said exhaust manifold;

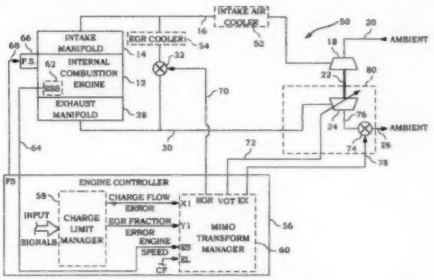
a bypass fluid line connected and in communication with,said combustion air supply, and connected and in communication with said intake manifold and bypassing said venturi assembly; and

a bypass valve, controlling flow through said bypass fluid line, said bypass control valve being responsive to pressure differential on opposite sides of said venturi assembly.

US 6,408,834 B1
SYSTEM FOR DECOUPLING EGR FLOW AND TURBOCHARGER SWALLOWING CAPACITY/ EFFICIENCY CONTROL MECHANISMS

Lary J. Brackney; Thomas A. Dollmeyer; Paul R. Miller, and Chuan He, all of Columbus, Ind., assignors to Cummins, Inc., Columbus, Ind.

Filed Jan. 31, 2001, Appl. No. 773,654
Int. Cl. F02M *25/07*
U.S. Cl. 123—568.21 **21 Claims**



1. A method of controlling an EGR flow control system of an internal combustion engine, the method comprising the steps of:

receiving commanded charge flow and EGR fraction values;

determining a current engine operating point;

performing a coordinate transformation on said commanded charge flow and EGR fraction values as a function of said current engine operating point and producing a first transform value in accordance therewith; and

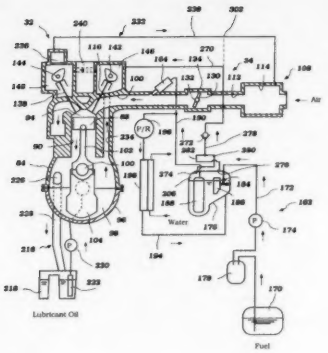
controlling a first charge flow control actuator independently of any other charge flow control actuator based on said first transform value.

US 6,408,835 B1
FUEL VAPOR EMISSION SYSTEM

Goichi Katayama; Masashi Nonaka, and Masaki Okazaki, all of Shizuoka, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 25, 2000, Appl. No. 648,827
Claims priority, application Japan, Aug. 26, 1999, 11-240340
Int. Cl. F02M *37/20*
U.S. Cl. 123—572 **31 Claims**

1. An internal combustion engine comprising a cylinder body defining a cylinder bore in which a piston reciprocates, a cylinder head member closing one end of the cylinder bore to define a combustion chamber with the cylinder bore and the piston, a crankcase member closing the other end of the cylinder bore to define a crankcase in which a crankshaft is journalled for rotation, an air induction system arranged to introduce air for combustion in the combustion chamber, a fuel supply system arranged to supply fuel for combustion in the combustion chamber, the fuel supply system including a fuel reservoir in which a space for fuel vapors is defined, a fuel injector arranged to spray the fuel, a fuel pump arranged to pressurize the fuel in the fuel reservoir for delivery to the fuel injector, a fuel return passage arranged to return excess

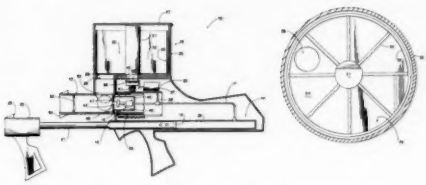


fuel to the fuel reservoir, a heat exchanger arranged to remove heat from the fuel flowing through the fuel return passage, the heat exchanger being mounted on the cylinder head member, and a heat insulator arranged to inhibit heat from the cylinder head member from conducting to the heat exchanger, a lubrication system arranged to lubricate at least one component of the engine with lubricant, a ventilation system arranged to couple the crankcase with the air induction system so as to deliver at least oil vapors in the crankcase to the air induction system, and a fuel vapor passage arranged to couple the space of the fuel reservoir with the ventilation system.

US 6,408,836 B1
BULLET FEEDING DEVICE FOR PNEUMATIC TOY GUNS
Chen Ming-Hsien, 11F-2, No. 43, Chai-I Street, Taichung City, Taiwan
Filed Jan. 2, 2001, Appl. No. 751,818
Int. Cl. F41B *11/02*
U.S. Cl. 124—49 **2 Claims**

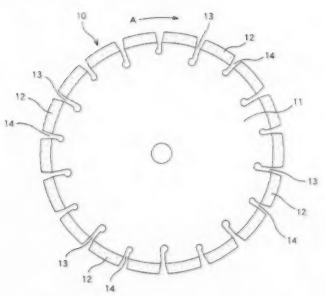
1. A pneumatic toy gun with a bullet feeding device, comprising:
a groove and two first holes respectively defined through a barrel of said gun, and
said bullet feeding device comprising a first part and a second part, said first part having a feeding tube with an open top and a feeding hole defined in a lower end of said feeding tube, a first flange extending from said first part, said second part having a protrusion extending therefrom so as to be inserted into said groove in said barrel, two second holes defined through said second part and two screws extending through said second holes and engaged with said barrel, a second flange extending from said second part so as to be connected to said first flange.

US 6,408,837 B1
TOY GUN WITH MAGAZINE
Lonnie G. Johnson, Atlanta; John T. Applewhite, Smyrna, and Jeffrey Shane Matthews, Milner, all of Ga., assignors to Johnson Research & Development Co., Smyrna, Ga.
Filed Sep. 13, 1999, Appl. No. 395,279
Int. Cl. F41F *1/00*
U.S. Cl. 124—51.1 **18 Claims**



1. A toy gun adapted to launch a projectile comprising:
a launch tube having a breach adapted to receive a projectile;
a hopper in communication with said breach, said hopper having an outer housing having an annular outer wall and a floor, a central hub, an annular inner housing mounted concentrically within said outer wall, and a plurality of divider walls extending between said central hub and said inner housing thereby defining a plurality of projectile cells, each said projectile cell having a bottom opening therein, said outer housing having an opening therein sized and shaped to allow the passage of projectiles therethrough;
an indexer coupled to said central hub,
whereby the inner housing prevents contact of the projectile with the outer housing outer wall to prevent accidental binding of the projectile between the divider wall and the outer wall during indexing.

US 6,408,838 B1
ROTARY CUTTING SAW WITH SLITS SHAPED FOR MINIMIZING WEAR OF NECK PORTION
Seiya Ogata, and Hitoshi Makihara, both of Fukuoka-ken, Japan, assignors to Noritake Diamond Industries, Co., Ltd., Ukiha-gun, and Noritake Co., Ltd., Nagoya, both of Japan
Filed Jun. 26, 2000, Appl. No. 603,187
Claims priority, application Japan, Jul. 5, 1999, 11-190968
Int. Cl. B28D *1/04*
U.S. Cl. 125—15 **12 Claims**



1. A rotary cutting saw to be used in an operation for forming a groove in a work material, comprising:
a base disk; and
a plurality of abrasive segments which are bonded to an outer circumferential surface of said base disk so as to be spaced apart from each other in a circumferential direction of said base disk;
wherein said base disk has a plurality of slits for catching therein cutting chips produced during said operation, said plurality of

slits being formed in said outer circumferential surface of said base disk so as to be located between adjacent ones of said abrasive segments in said circumferential direction, each of said plurality of slits extending inwardly in a radial direction of said base disk from said outer circumferential surface of said base disk, and extending in an axial direction of said base disk over an entire axial length of said base disk;

wherein each of said slits is defined by a pair of side surfaces opposed to each other in said circumferential direction, and a part-cylindrical surface defining a part of a cylinder having an axis which is parallel to said axial direction, said side surfaces being connected at radially inner end portions thereof to said part-cylindrical surface;

wherein said part-cylindrical surface has a width as measured in said circumferential direction, which width is larger than a circumferential distance between said radially inner end portions of said side surfaces;

wherein said part-cylindrical surface is smoothly connected to one of said side surfaces without a stepped portion therebetween;

and wherein said one of said side surfaces of each of said slits is located on a forward side of the other of said side surfaces as viewed in a rotating direction of said base disk.

US 6,408,839 B1

WIRE SAWING DEVICE FOR CUTTING FINE SLICES USING ANGULAR CROSSING OF AT LEAST TWO SAWING YARN LAYERS

Charles Hauser, Genolier, Switzerland, assignor to HCT Shaping Systems SA, Cheseaux, Switzerland

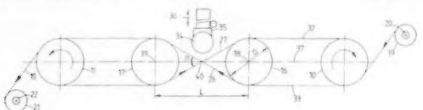
PCT No. PCT/IB99/00097, § 371 Date Aug. 14, 2000, § 102(e) Date Aug. 14, 2000, PCT Pub. No. WO99/41034, PCT Pub. Date Aug. 19, 1999

PCT Filed Jan. 25, 1999, Appl. No. 622,198

Claims priority, application Switzerland, Feb. 13, 1998, 364/98

Int. Cl. B28D *1/06*

U.S. Cl. 125—16.02 **14 Claims**



1. A wire sawing device comprising:

wire guide cylinders supporting a wire maintained in position by grooves provided on a surface of the wire guide cylinders which define an interval between the wires of a layer of wires, the wire being adapted to move with alternating or continuous movement while bearing against one piece to be sawed fixed on a support table;

wherein the wire guide cylinders comprise at least four wire guide cylinders arranged in a sequence following each other with two outer wire guide cylinders and at least two inner wire guide cylinders;

the wire being arranged on the outer wire guide cylinders at a first interval and on the inner wire guide cylinders at a second interval corresponding to half the first interval, the wire from a first groove on an inner wire guide cylinder passing to a groove of the outer wire guide cylinder to be returned to a second groove on the inner wire guide cylinder spaced by the second interval from the first groove;

and the wire coacting with adjacent inner wire guide cylinders and passing from an upper portion, respectively to a lower portion, of one of the inner wire guide cylinders in direct alignment with the lower portion, respectively the upper portion, of an adjacent inner wire guide cylinder so as to constitute an "X" arrangement formed of two layers of wires crossing at a crossing angle at least equal to 20° and determined by a diameter of the inner wire guide cylinders and by a spacing separating the axes of two adjacent inner wire guide cylinders.

US 6,408,840 B2

METHOD AND APPARATUS FOR CUTTING A RARE EARTH ALLOY

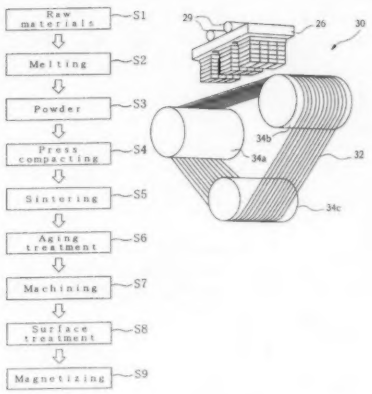
Hazime Ishida, Takatsuki, Japan, assignor to Sumitomo Special Metals Co., Ltd., Japan

Filed Dec. 12, 2000, Appl. No. 734,050

Claims priority, application Japan, Dec. 14, 1999, 11-354882; Dec. 28, 1999, 11-372991

Int. Cl. B28D *1/06*

U.S. Cl. 125—21 **25 Claims**



1. A method for cutting a rare earth alloy comprising the steps of: cutting an R—Fe—B rare earth sintered magnet to be machined, where R is a rare earth element, using a cutting wire while supplying a slurry comprising dispersed abrasive grains between said cutting wire and said R—Fe—B rare earth sintered magnet,

wherein the R—Fe—B rare earth sintered magnet is cut while being lowered from a position above said wire to a position below said wire,

wherein said wire is driven with a drive member, at least a wire contact face of said drive member being composed of an organic polymer material,

wherein said viscosity of said slurry at 25° C. is in range from 92 to 175 mPa·sec, and

wherein said cutting is carried out while a tension in a range between 14.7N and 39.2N is applied to said wire.

US 6,408,841 B1

HEAT INSULATED HOUSING FOR A REFRIGERATION DEVICE AND A DOMESTIC OVEN

Jürgen Hirath, Heidenheim, and Markus Schütte, Nürnberg, both of Germany, assignors to BSH Bosch und Siemens Hausgeraete GmbH, Munich, Germany

Division of application No. 09/174,293, filed on Oct. 16, 1998. This application Feb. 1, 2000, Appl. No. 495,792.

Claims priority, application Germany, Oct. 16, 1997, 197 45 825

Int. Cl. A21B *1/00;* **A47J** *39/00;* **F25D** *23/00*

U.S. Cl. 126—19 R **2 Claims**

2. A domestic oven, comprising:

a heat-insulated oven muffle;

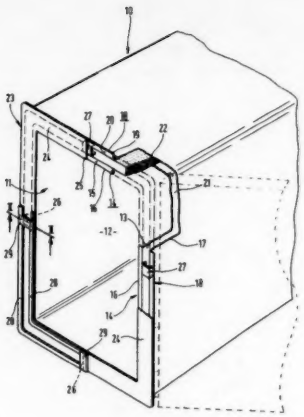
a door connected to said heat-insulated oven muffle for closing said heat-insulated oven muffle;

said heat-insulated oven muffle and said door each including:

an at least substantially vacuum-tight thin-walled connection element having two edge strips;

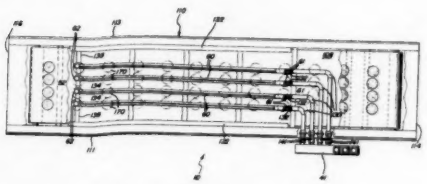
an evacuable thermal insulation material; and

two surface layers disposed at a distance from one another and being at least substantially vacuum-tight in construction, said two surface layers together with said at least



substantially vacuum-tight connection element enclosing an evacuable space filled with said evacuable thermal insulation material, said two surface layers having angled sections with a given thickness and free edges directed away from said evacuable space, said at least substantially vacuum-tight connection element disposed on and fastened to said angled sections in a vacuum-tight fashion, and said two edge strips having a thickness substantially equal to the given thickness of said angled sections.

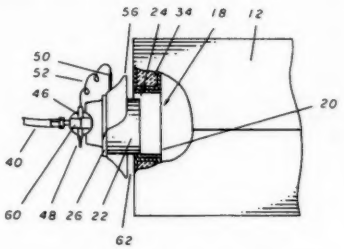
US 6,408,842 B1
OVEN
Alfred Herrera, 13002 Lantern La., La Mirada, Calif. 90638
Filed Mar. 29, 2000, Appl. No. 538,601
Int. Cl. A21B *1/02; 1/42*
U.S. Cl. 126—41 C **6 Claims**



1. An oven having an infeed end, an outfeed end, and a horizontal plane, the oven comprising:
- a movable carrier to support a product to be heated, the carrier being movable in a first longitudinal direction between the infeed end and the outfeed end;
- a deck of longitudinal burners disposed on the horizontal plane, each of the longitudinal burners extending in a second longitudinal direction between the Infeed end and the outfeed end; and
- an infrared burner disposed above the deck of longitudinal burners,
- wherein the second longitudinal direction is diagonal to the first longitudinal direction.

2. An oven having an infeed end, an outfeed end, and a horizontal plane, the oven comprising:
- a movable carrier to support a product to be heated, the carrier being movable in a first longitudinal direction between the infeed end and the outfeed end; and
- a deck of longitudinal burners disposed on the horizontal plane, each of the longitudinal burners extending in a second longitudinal direction between the infeed end and the outfeed end,
- wherein the second longitudinal direction is diagonal to the first longitudinal direction, and
- wherein the longitudinal burners are oriented in a V-formation.

US 6,408,843 B1
PORTABLE GROUND THAWING APPARATUS
Lawrence Bernard Olson, Princeton, Minn., assignor to Ground Specialties, Inc., Milaca, Minn.
Provisional application No. 60/123,003, filed on Mar. 5, 1999.
This application Mar. 3, 2000, Appl. No. 517,767.
Int. Cl. F23C *5/00*
U.S. Cl. 126—271.2 R **18 Claims**



1. A portable ground thawing apparatus, comprising:
- a portable insulated thaw body defining an enclosed inner cavity said thaw body having a top section, side sections and an open bottom thawing section;
- a thaw body opening having a first diameter on said thaw body wherein one of said side walls defines therein said thaw body opening;
- a radiant type heater having a fuel inlet, a radiant burner and a burner control; and
- a tube section having a first and second end and a diameter less than said first diameter of said thaw body opening, said first end fixedly attached to said portable insulated thaw body such that said first end extends into said thaw body opening and defines a vent gap section for the free passage of gases between said tube section and said thaw body opening, said second end of said tube section being fixedly attached to said radiant type heater so as to completely encompass said radiant burner such that said tube section directs heat from said radiant burner into said inner cavity of said thaw body said second end and said radiant type heater being positioned outside of said thaw body.

US 6,408,844 B1
BREATHING APPARATUS
Hwa-joon Lee, 48-17, Jeonnong-3-dong, Tongdaemun-gu, Seoul, Rep. of Korea
PCT No. PCT/KR99/00203, § 371 Date Dec. 7, 2000, § 102(e) Date Dec. 7, 2000, PCT Pub. No. WO00/09391, PCT Pub. Date Feb. 24, 2000
PCT Filed Apr. 28, 1999, Appl. No. 719,080
Claims priority, application Rep. of Korea, Aug. 12, 1998, 1998-15158
Int. Cl. B63C *11/16*
U.S. Cl. 128—201.11 **6 Claims**

1. A breathing apparatus for use in combination with a tube for swimming, the breathing apparatus comprising:
- a floatable body having a hollow case for floating over water level and an opening; and
- a breathing assembly for providing fresh air from the outside to a swimmer's mouth, the breathing assembly having:
  - a connector having a connecting pipe to be inserted within the opening of the floatable body and a flexible connecting

hose having an end portion connected to a lower end portion of the connecting pipe;

a fixing cap for providing fresh air from the outside to the breathing assembly, the fixing cap being mounted on an upper central portion of the floatable body and removably attached to the connecting pipe to prevent separation of the connecting pipe from the fixing cap, wherein the fixing cap has an upper member and a lower member which may be separated from each other, the lower member of the fixing cap having at least two or more protrusions from a lower outer surface thereof in contact with the upper central portion of the floatable body, at least two or more spaces between the protrusions, and a plurality of holes, said protrusions, spaces, and holes defining a passageway to allow fresh air from the outside into the breathing assembly;

a mouth connecting member connected to the other end portion of the connecting hose, the mouth connecting member having an air entry portion positioned near the connected portion of the connecting hose and the mouth connecting member, an air exit portion positioned near a lower end portion of the mouth connecting member, and a mouth piece formed integrally with the mouth connecting member, the mouth piece positioned between the air entry portion and the air exit portion, the mouth connecting member providing air from the fixing cap to the swimmer's mouth through the mouth piece;

an air intake check member arranged at the air entry portion, the air intake check member having an inlet check valve opened only in the direction of the air entry to prevent counterflow of exhausted air;

a water intake check member arranged at the air exit portion, the water intake check member having an outlet check valve for discharging exhausted air outside and for preventing entry of water from outside into the breathing assembly, wherein the inlet check valve is opened for breathing in of the swimmer, the outlet check valve is shut for preventing upward flow of exhausted air and entry of water, and when the outlet check valve is opened for discharging exhausted air, the inlet check valve is shut; and

a bendable guide hose connected to the air exit portion at the lower end portion of the mouth connecting member, wherein the guide hose is bendable by the swimmer to direct exhausted air away from the swimmer's field of vision.

US 6,408,845 B1
RESPIRATORY FILTER

Michael Pereira, 33 Booth Ave., Warwick, R.I. 02893; Anthony Ricci, 149 Cardinal Rd., Cranston, R.I. 02921, and Pierre Legare, RR2, Addison, Ontario, Canada, K0E 1A0

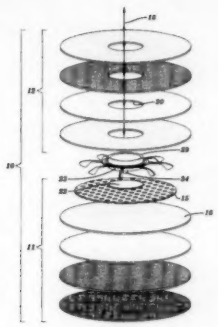
Provisional application No. 60/047,119, filed on May 19, 1997. This application May 19, 1998, Appl. No. 81,144.

Int. Cl. A61M *16/00;* **A62B** *27/00;9/00;* **C08B** *3/00;5/00*

U.S. Cl. 128—202.22 **20 Claims**

1. A seal check mechanism for a respirator, comprising:

an air passageway in the respirator, the air passageway having a sealing rim;



a blocking member selectively movable between engaged and disengaged positions relative to said sealing rim; and

a spring element disposed to releasably maintain said blocking member in said disengaged position during respirator operation;

wherein said blocking member is user actuatable against the spring element's bias to move said blocking member into said engaged position to substantially prevent entry of air into said air passageway during seal checking.

US 6,408,846 B1
INHALATION TYPE DRUG DISPENSER

Hisatomo Ohki; Kazunori Ishizeki; Shigemi Nakamura; Yoshiyuki Yazawa, all of Gunma, and Akira Yanagawa, Yokohama, all of Japan, assignors to Unisia Jecs Corporation, Atsugi, and Dott Limited Company, Yokohama, both of Japan

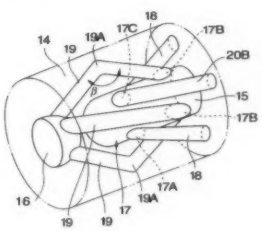
PCT No. PCT/JP99/07304, § 371 Date Sep. 11, 2000, § 102(e) Date Sep. 11, 2000, PCT Pub. No. WO00/41756, PCT Pub. Date Jul. 20, 2000

PCT Filed Dec. 27, 1999, Appl. No. 623,457

Claims priority, application Japan, Jan. 11, 1999, 11-004671

Int. Cl. A61M *15/00*

U.S. Cl. 128—203.15 **7 Claims**



1. An inhalant medicator comprising:

a medicator body formed at one axial end with a granular medicine accommodation chamber and at the other axial end with an inhalant port for inhalation of granular medicines;

an inflow air passageway communicating an atmosphere side with the granular medicine accommodation chamber for supplying air into the granular medicine accommodation chamber of the medicator body;

an outflow air passageway through which the granular medicines of the granular medicine accommodation chamber are flown out;

a granular medicine diffusion chamber disposed between the inhalant port and the granular medicine accommodation chamber and formed with an inflow opening located at a side of the inhalant port and an outflow opening located at a side of the granular medicine accommodation chamber;

a diffusion chamber inflow passage communicating the outflow air passageway with the inflow opening of the granular medicine diffusion chamber; and

a diffusion chamber outflow passage communicating the outflow opening of the granular medicine diffusion chamber with the inhalant port.

US 6,408,847 B1

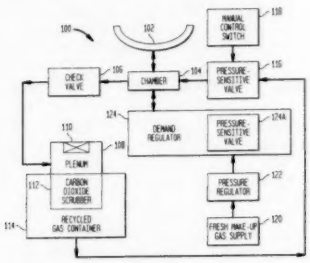
REBREATHER SYSTEM THAT SUPPLIES FRESH MAKE-UP GAS ACCORDING TO A USER'S RESPIRATORY MINUTE VOLUME

Marshall L. Nuckols, 427 Halsey Rd., and W. Scott Finlayson, 1893 Lindamoor Dr., both of Annapolis, Md. 21401

Filed Aug. 29, 2000, Appl. No. 652,110

Int. Cl. A61M *16/00*

U.S. Cl. 128—204.18 **19 Claims**



1. A rebreather system, comprising:

a mouthbit insertable in a user's mouth;

a chamber coupled to said mouthbit, wherein a vacuum pressure develops in said chamber as a breathing gas is drawn by the user from said chamber, and wherein a positive pressure develops in said chamber as an exhalation gas is expelled by the user into said chamber;

first means coupled to said chamber for supplying a mass of fresh make-up gas to said chamber based on pressure in said chamber, said mass of fresh make-up gas being zero for said positive pressure and increasing as said vacuum pressure increases; and

second means coupled to said chamber for receiving and processing said exhalation gas to produce a recycled gas suitable for breathing, said second means further coupled to said chamber for supplying a volume of said recycled gas to said chamber based on said pressure in said chamber, said volume of said recycled gas being zero for said positive pressure and for low levels of said vacuum pressure up to a threshold vacuum pressure, said volume of said recycled gas increasing proportional to increases in said mass of fresh make-up gas as said vacuum pressure increases beyond said threshold vacuum pressure, wherein said recycled gas and said fresh make-up gas mix in said chamber prior to inhalation therefrom.

US 6,408,848 B1

METHOD AND APPARATUS FOR CONVENIENTLY SETTING A PREDETERMINED VOLUME FOR RE-BREATHING

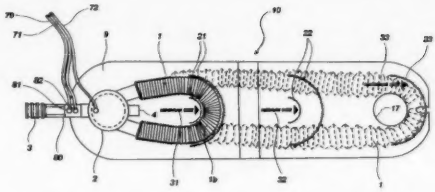
Barry J. Feldman, Plano, Tex.; Anthony T. Pierry, Plantsville, Conn.; William J. Wohltmann, San Jose, Calif., and John A. Triunfo, Jr., Fairfield, Conn., assignors to NTC Technology, Inc., Wilmington, Del.

Filed Mar. 28, 2000, Appl. No. 537,028

Int. Cl. A62B *9/00*

U.S. Cl. 128—205.14 **23 Claims**

1. A device for calibrating a volume of a variable-length tubing loop for re-breathing use in a respiratory circuit, comprising:



a card of substantially inelastic material comprising:

a first face;

a second face;

a first end configured for affixation with respect thereto of a portion of a tubing loop extending over one of the first face and the second face of the card;

a second end remote from the first end; and

a plurality of template indicia marked on said first face of said card between the first end and the second end corresponding to a plurality of volumes to which said tubing loop may be adjusted by adjustment of tubing loop length.

US 6,408,849 B1

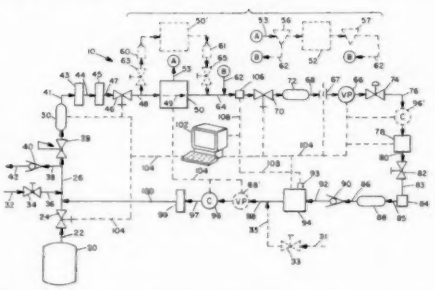
RECOVERY AND PURIFICATION OF GASES USED IN MEDICAL PROCESSES

Jeffrey J. Spiegelman, La Jolla; Daniel Alvarez, Jr., San Diego; Peter K. Shogren, San Diego, and Joshua T. Cook, San Diego, all of Calif., assignors to Aeronex, Inc., San Diego, Calif.

Filed Jun. 18, 1999, Appl. No. 336,060

Int. Cl. A62B *23/02;7/10*

U.S. Cl. 128—205.27 **42 Claims**



1. A method for recovery and purification of a gas used to enhance a medical process, which comprises:

a. passing said gas to said medical process and therein using said gas for enhancement of said process, use in said process also causing gaseous or liquid contaminants including water vapor, carbon dioxide, oxygen or nitrogen, to become incorporated into said gas;

b. collecting at least a portion of thus-contaminated gas;

c. determining which said gaseous or liquid contaminants are contained in said gas;

d. drying said contaminated gas to reduce said water concentration in said contaminated gas to not greater than 10 ppm, if said contaminated gas contains a water concentration;

e. contacting said contaminated gas with a carbon dioxide absorbent to reduce said carbon dioxide concentration to not greater than 10 ppm, if said contaminated gas contains a carbon dioxide concentration;

f. contacting said contaminated gas with an oxygen absorbent to reduce said oxygen concentration to not greater than 1 ppm, if said contaminated gas contains an oxygen concentration;

g. contacting said contaminated gas with a nitrogen getter to reduce said nitrogen concentration to not greater than 1 ppm, if said contaminated gas contains a nitrogen concentration;

h. reducing other non-noble gaseous contaminants to not greater than 10 ppm, if said contaminated gas contains said other non-noble gaseous contaminants; and

i. collecting said gas after such decontamination for recycle to said medical process and subsequent reuse therein.

US 6,408,850 B1

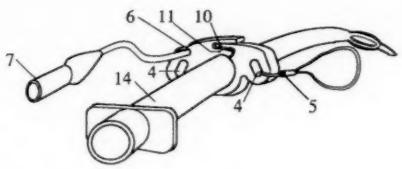
MEDICAL TUBE HOLDER APPARATUS

Michael Sudge, 653 #C Idlewild Cir., Birmingham, Ala. 35205

Continuation-in-part of application No. 08/015,555, filed on Feb. 9, 1993, now abandoned. This application Jan. 21, 1994, Appl. No. 184,212.

Int. Cl. A61M *16/00*

U.S. Cl. 128—207.17 **21 Claims**



1. A medical tube holder apparatus comprising a one-piece flexible elongated strip clamp means configured transversely to engage frictionally about substantially the entire circumferential cross-section of medical tubes for oral and nasal insertion having radii within a predetermined range, with opposing interlocking extremities accommodating said differing tube radii, and with opposing attaching means integral with said clamp means for affixing a harness means, wherein an upper perimeter portion thereof between the said opposing attaching means contains resilient material with a separation which widens immediately beneath said perimeter to form a c-shaped pocket of resilient but fixed configuration, to receive and maintain in place an auxiliary medical tube.

US 6,408,851 B1

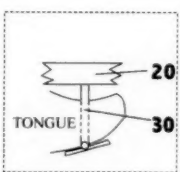
METHOD AND DEVICE FOR HOLDING A TONGUE IN A FORWARD POSITION

Manuel L. Karell, 3573-22 St., San Francisco, Calif. 94114

Filed Oct. 1, 1999, Appl. No. 411,349

Int. Cl. A61F *5/56*

U.S. Cl. 128—848 **14 Claims**



1. A device for reducing interference of breathing or bruxism by holding a tongue in a forward position comprising a structural support means having a configuration that is adapted for insertion into a user's mouth, an attachment means attached directly to said structural support, said attachment means includes a vertical member extending from said structural support and a bar attached to said vertical member by a horizontal pivot mechanism which permits to the bar to be inserted in the tongue, than rotated from a vertical position to a horizontal position so the bar can be locked against the lower surface of the user's tongue.

US 6,408,852 B2

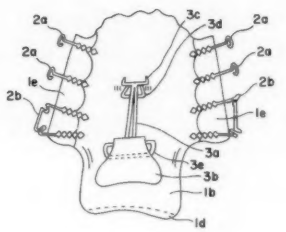
ORAL ORTHESIS TO REDUCE SNORING AND SLEEP APNEA SYMPTOMS

W. M. J. Tielemans, Maaseik, Belgium, assignor to TNV Research and Development, Netherlands

Provisional application No. 60/175,394, filed on Jan. 11, 2000. This application Jan. 11, 2001, Appl. No. 760,088.

Int. Cl. A61F *5/56*

U.S. Cl. 128—848 **14 Claims**



1. Oral orthesis for reducing snoring and sleep apnea symptoms comprising a maxilla palate plate (**1**) and, attached thereon, fixing means (**2**) to fix the plate in the oral cavity and a tongue positioning device (**3**), characterized in that the plate (**1**) extents to cover and support also the soft tissue (**1***b*) of the palate moll, the tongue positioning device (**3**) consists of rotatable pellotte (**3***b*) attached to a bar (**3***a*) mounted into the plate with a spring wire (**3***c* and **3***d*) engaged to press the pellotte against the tongue.

US 6,408,853 B1

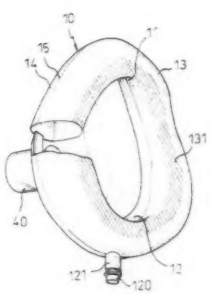
MEDICAL FACEMASK AND A MOLD FOR MANUFACTURING THE MEDICAL FACEMASK

Ti-Li Chang, No. 6, Lane 90, Shen-Lin Rd., Shen-Kang Hsiang, Taichung Hsien, Taiwan

Filed Jun. 27, 2001, Appl. No. 891,468

Int. Cl. A61F *11/00*

U.S. Cl. 128—857 **6 Claims**



1. A medical facemask comprising:

a shell adapted to be connected to an air source; and

an air cushion attached to the shell with an airtight fit, the air cushion being a bladder structure and including:

a facing side adapted to fit on a user's face around the nose and mouth;

a connecting side attached to the shell, wherein the facing side has a thickness thinner than that of the connecting side;

a nipple integrally outward extending from the air cushion; and

a check valve securely received in the nipple so that air can be pumped into the air cushion.

US 6,408,854 B1

INSULIN DELIVERY ENHANCED BY COACHED BREATHING

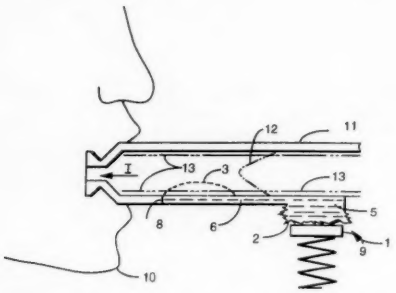
Igor Gonda, San Francisco, and Reid M. Rubsamen, Oakland, both of Calif., assignors to Aradigm Corporation, Hayward, Calif.

Division of application No. 09/064,809, filed on Apr. 22, 1998, now Pat. No. 6,085,753, which is a continuation of application No. 08/754,423, filed on Nov. 22, 1996, now Pat. No. 5,743,250, which is a continuation-in-part of application No. 08/549,343, filed on Oct. 27, 1995, now Pat. No. 5,915,378, which is a continuation-in-part of application No. 08/331,056, filed on Oct. 28, 1994, now Pat. No. 5,672,581, which is a continuation-in-part of application No. 08/011,281, filed on Jan. 29, 1993, now Pat. No. 5,364,838. This application Apr. 21, 2000, Appl. No. 553,693.

This patent is subject to a terminal disclaimer.

Int. Cl. A61B *19/00*

U.S. Cl. 128—898 13 Claims



1. A method of enhancing the rate at which a drug migrates into a patient's circulatory system, comprising:

aerosolizing a formulation comprising a drug; followed by

inhaling the aerosolized formulation into lungs of a patient and allowing particles of the formulation to deposit on lung tissue; followed by

inhaling maximally followed by exhaling the forced vital capacity of the lungs.

US 6,408,855 B1

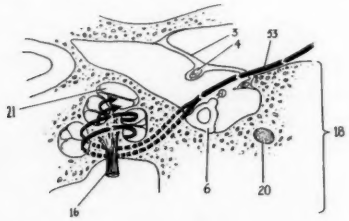
MEANS FOR IMPLANTING A DEVICE IN THE CANALIS COCHLEARIS

Peter Berrang, and Alan Lupin, both of Victoria, Canada, assignors to Epic Biosonics Inc., Victoria, Canada

Division of application No. 09/070,999, filed on May 4, 1998. This application Jun. 19, 2000, Appl. No. 597,813.

Int. Cl. A61B *19/00;* A61F *2/18*

U.S. Cl. 128—898 16 Claims



1. A method of implanting a prosthesis in the cochlea, comprising inserting said prosthesis between the bone surface and the skin of the external ear canal and into the middle ear, and from the middle ear to the cochlea.

US 6,408,856 B1

SMOKABLE FILLER MATERIAL FOR SMOKING ARTICLES

Kevin Gerard McAdam, Southampton, United Kingdom, assignor to British-American Tobacco (Investments) Limited, Staines, United Kingdom

PCT No. PCT/GB97/00587, § 371 Date Sep. 1, 1998, § 102(e) Date Sep. 1, 1998, PCT Pub. No. WO97/32490, PCT Pub. Date Sep. 12, 1997

PCT Filed Mar. 4, 1997, Appl. No. 142,096

Claims priority, application United Kingdom, Mar. 7, 1996, 9605554

Int. Cl. A24B *15/00*

U.S. Cl. 131—352 19 Claims

1. A smoking article smokable filler material comprising aerosol generating means, a substantially non-combustible inorganic filler, a binder, and an extract of a fuel source, the smokable filler material comprising dry starting materials including about 10% to about 30% aerosol generating means, about 20% to about 80% inorganic filler material, and about 5% to about 25% pectinaceous binder, all by weight of the dry starting materials of the smokable filler, and the smokable filler further comprising 0.1% to about 30% extract, by weight of the smokable filler material, the filler material further comprising more than one plant polysaccharide biopolymer.

US 6,408,857 B1

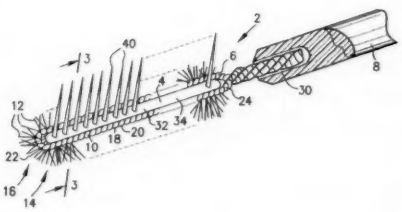
COMBINATION COSMETIC APPLICATOR BRUSH AND COMB

Charles P. Neuner, Amityville, N.Y., assignor to Color Access, Inc., Melville, N.Y.

Filed Jul. 19, 2000, Appl. No. 618,351

Int. Cl. A45D *40/26*

U.S. Cl. 132—218 12 Claims



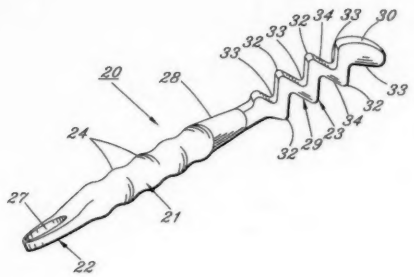
1. A comb insert for a cosmetic brush having a core formed from a pair of intertwisted wire segments, a first length of the core comprising a brush portion defined by a plurality of bristles secured between the pair of intertwisted wire segments, and a second length of core forming a closed loop at least part of which includes the brush portion, the comb insert comprising:

a base having opposite face surfaces connected by a peripheral wall, the peripheral wall defining a perimeter;

a plurality of teeth extending from at least one of the face surfaces; and

means on the base for securing the base to the loop, the means having at least two clearances each positioned opposite the other about the perimeter, each opening outwardly relative to the perimeter and dimensioned to receive an inwardly directed part of the cross section of the second length of the core forming the loop, each clearance spaced from the other to receive the respective inwardly directed part of the cross section in interference fit.

US 6,408,858 B1
HAIR CURLER/ROLLER
Robert J. Emmons, Farmington, and Duane Hein, Monroe, both of Conn., assignors to Remington Corporation, L.L.C., Bridgeport, Conn.
Filed Jul. 2, 2001, Appl. No. 895,731
Int. Cl. A45D *2/20;2/00;2/18*
U.S. Cl. 132—247 **24 Claims**



1. A one-piece, clipless hair roller or curler constructed for ease of use and comprising a single, substantially continuous body member incorporating

A. an elongated, central section having
  a. a first end and a second end, each of which are formed on opposed surfaces of the central section,
  b. a generally cylindrical shape comprising a substantially circular shaped cross-section throughout its length and incorporates a plurality of rounded zones formed thereon in juxtaposed, spaced relationship for providing hair curling effects to the hair fibers wound thereon;

B. a latching member
  a. formed at the first end of the elongated central section,
  b. constructed for mating, locking engagement with a finger portion; and
  c. comprising a closed loop or eyelet having a generally oval shape;

C. an elongated finger portion
  a. formed at the second end of the central section;
  b. comprising a substantially rectangular cross-sectional shape, having substantially flat, opposed side surfaces and incorporating a plurality of independent locking zones formed along the length thereof, with each of said locking zones comprising a substantially "V" shape for providing locking engagement with a portion of the oval-shaped loop or eyelet, and
  c. constructed for being arcuately pivoted from a first curler open position to a second curler closed position, wherein at least one of said locking zones is securely engaged with the latch member of the curler; and

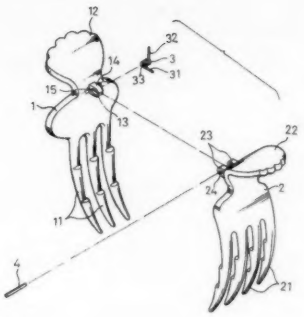
D. an elongated, flexible rod mounted in the central section for imparting strength, rigidity and flexibility thereto;

whereby hair fibers wound about the central section of the curler are quickly and easily securely held in place by merely arcuately pivoting the elongated finger portion from its first position to its second, locked and engaged position.

US 6,408,859 B1
DEVICE FOR STYLING HAIR
Shyh Ming Shyu, No. 119, Lane 234, Chengbei Road, Tainan, Taiwan, 708
Filed May 21, 2001, Appl. No. 860,691
Int. Cl. A45D *8/00;8/20*
U.S. Cl. 132—276 **3 Claims**

1. A hair styling device comprising:

a) a first clasp plate including a block extended therefrom, said block including an aperture formed therein and including a channel formed therein and communicating with said aperture of said block, said aperture of said block including a diameter greater than that of said channel of said block,

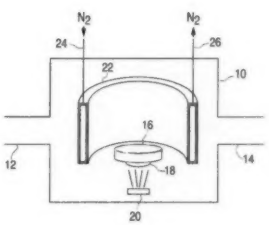


b) a second clasp plate including a pair of ears extended therefrom, said ears each including a hole formed therein and to be aligned with said aperture of said block,

c) a coil spring received in said aperture of said block and including an orifice formed therein, and including two legs extended between said block and said ears and engaged with said first and said second clasp plates respectively for biasing said combs toward each other, said coil spring including a diameter greater than that of said aperture of said block for allowing said coil spring to be stably retained in said aperture of said block, said legs of said coil spring being engaged through said channel of said block for allowing said coil spring to be engaged into and stably retained in said aperture of said block, and

d) a shaft engaged through said holes of said ears and said orifice of said coil spring for pivotally securing said clasp plates together.

US 6,408,860 B1
METHOD FOR CLEANING PHOSPHORUS FROM AN MBE CHAMBER
Patrick T. Chin, Marina del Rey; Todd K. Makishi, Harbor City, and Thomas R. Block, Los Angeles, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed Sep. 21, 2000, Appl. No. 668,104
Int. Cl. B08B *9/00;7/00*
U.S. Cl. 134—22.1 **5 Claims**



1. A method for removing deposits from a chamber comprising the steps of:

providing a panel within the chamber onto which deposits are formed;

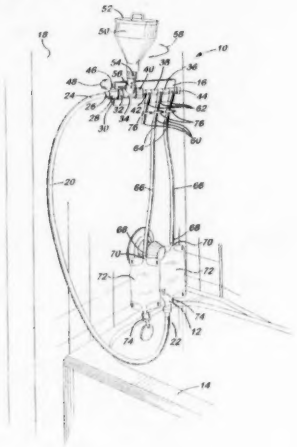
cooling said panel;

introducing water vapor into said chamber causing ice to form on said cooled panel;

removing said panel from said chamber while covered with ice; and

cleaning said removable panel.

US 6,408,861 B1
URINE BAG CLEANING MANIFOLD
John Ortega, 486 W. 91st. Cir., Thornton, Colo. 80221
Filed Oct. 21, 1999, Appl. No. 422,809
Int. Cl. B08B *9/00*
U.S. Cl. 134—100.1 **11 Claims**



1. A urine bag cleaning manifold capable of pre-mixing a cleaning solution and water for washing one or more urine bags, the urine bag cleaning manifold is adapted for attaching to a bathroom sink faucet, bathtub faucet and other faucets for circulating the warm water from the faucet and cleaning solution therethrough, the cleaning manifold adapted for introducing the warm water and cleaning solution in an inlet in the top of the urine bag and draining out an outlet in the bottom of the urine bag, the cleaning manifold comprising:

a hollow manifold body having an upstream mixing section having a first end and a second end, the first end of said mixing section adapted for receiving the warm water therein, said manifold body also having a downstream discharge section having a first end and a second end, the second end of said mixing section attached to the first end of said discharge section;

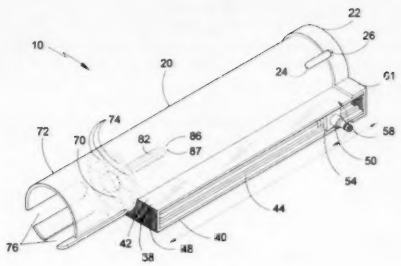
a cleaning solution container attached to sides of an opening in an upper portion of said mixing section, said cleaning solution container adapted for feeding the cleaning solution into said mixing section;

at least one outlet valve attached to sides of an opening in a lower portion of said discharge section; and

an outlet tube having a first end and a second end, the first end of said outlet tube attached to said outlet valve, the second end of said outlet tube adapted for attachment to the inlet in the top of the urine bag, said outlet tube extending downwardly from said outlet valve for filling the urine bag by water pressure and gravity and cleaning the urine bag as the warm water and cleaning solution flows downwardly therethrough and out the outlet in the bottom of the urine bag.

US 6,408,862 B1
CENTRIFUGAL PAINT ROLLER CLEANER
Roland H van Rooyen, 16 Bridgewater Road, Bridgewater Estates, Somerset West 7130, South Africa
Filed Apr. 28, 2000, Appl. No. 560,792
Int. Cl. B08B *3/02*
U.S. Cl. 134—138 **23 Claims**

1. An apparatus for receiving fluid from the hose member of a fluid source to clean a paint roller brush of the type that rotates on a paint roller frame, the paint roller frame having a handle, an arm,



and a mandrel rotatably positioned on the arm, the paint roller brush being secured on the mandrel, the apparatus comprising:

(a) a housing member, the housing member having a cylinder, the housing member having a paint roller brush receiving end, for receiving the paint roller brush into the housing member cylinder, the housing member further having a slot for fluid communication into the cylinder, the housing member further having a discharge end for discharging fluid from the housing member cylinder, the housing member further having a keyway, the keyway being adapted to closely receive the paint roller frame arm;

(b) a disc attached to the housing member discharge end, the disc having at least one aperture for allowing fluid to exit the housing member cylinder;

(c) a closing member for opening and closing the housing member receiving end, the closing member having a keyway, the closing member keyway being alignable with the housing member keyway such that the paint roller frame arm is retained when the housing member is closed, the closing member further having a retaining channel, the retaining channel closely receiving the paint roller frame arm, and aligning the paint roller frame arm for roller brush rotation within the housing member cylinder; and

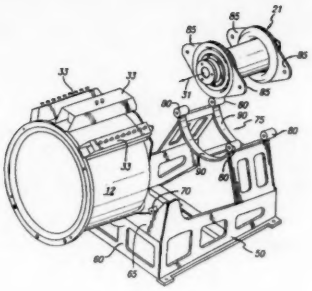
(d) a fluid source guide member for receiving and securing the fluid source hose member, the fluid source guide member being positioned adjacent the housing member slot such that the fluid source hose member is slidable along the housing member slot, such movement directing the fluid through the housing member slot and onto the paint roller brush, causing the paint roller brush to rotate on the paint roller frame arm;

(e) said fluid source hose member being of the type having a pair of parallel and opposing flanges, the fluid source guide member further comprising a first and second side, each of the fluid source guide member sides having a ridge, each such ridge being loosely received by the fluid source hose member flanges, such that the fluid source hose member is slidably and rotatably held within the fluid source guide member, causing the angle at which the fluid strikes the paint roller brush to vary.

US 6,408,863 B1
SEAL CONFIGURATION FOR USE WITH A MOTOR DRIVE ASSEMBLY IN A MICROELECTRONIC WORK PIECE PROCESSING SYSTEM
Aleksander Owczarz, Fremont, Calif., assignor to Semitool, Inc.
Division of application No. 08/897,914, filed on Jul. 21, 1997, now Pat. No. 6,098,641. This application Jul. 5, 2000, Appl. No. 610,175.
This patent is subject to a terminal disclaimer.
Int. Cl. B08B *13/00*
U.S. Cl. 134—140 **10 Claims**

1. An apparatus for processing a wafer, the apparatus comprising:

a processing bowl defining a processing chamber;



a wafer support structure adapted to support at least one wafer, the wafer support being mounted for rotation within the processing chamber;

a motor drive assembly disposed exterior to the processing chamber and connected to rotate the wafer support, the motor drive assembly comprising an electrically driven motor having a rotor that rotates about an axis of rotation, the rotor having expulsion threads at an end thereof that is proximate the wafer support structure; and

a member substantially surrounding the expulsion threads at the end of the rotor proximate the wafer support structure, the member forming a chamber with the rotor, rotation of the rotor assisting in preventing foreign materials from entering the motor.

US 6,408,864 B1

SILO TYPE STORAGE TANK WITH CLEAN-IN-PLACE SPRAY OPENING HAVING CHAMFERED EDGE TRANSITION, AND ALTERNATE HELPER TUBE AND SPIKE

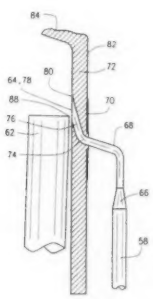
Jeffrey W. Brunson, Nixa, and Kevin W. Bartholomaus, Springfield, both of Mo., assignors to Paul Mueller Company, Springfield, Mo.

Continuation-in-part of application No. 09/392,863, filed on Sep. 9, 1999. This application Oct. 26, 1999, Appl. No. 426,468.

This patent is subject to a terminal disclaimer.

Int. Cl. B08B *3/02*

U.S. Cl. 134—166 R **45 Claims**



1. A silo type storage tank having a clean-in-place system for cleaning inside surfaces of said tank including its top and sidewalls, said system comprising an upwardly directed channel through the sidewall of said tank for spraying a cleaning fluid onto the inside top surface of the tank and at least one additional spray opening oriented to direct a cleaning fluid against the sidewall of the tank beneath the channel opening to thereby clean the sidewall below the channel opening.

US 6,408,865 B1

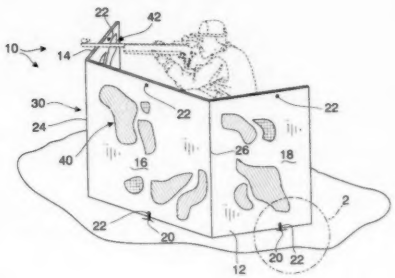
MULTI-SEASONAL DISPOSABLE HUNTING BLIND

Ronnie W. Bliss, 2900 E. 6th #105, Stillwater, Okla. 74074

Provisional application No. 60/156,389, filed on Sep. 28, 1999. This application Sep. 12, 2000, Appl. No. 659,910.

Int. Cl. E04H *15/62*

U.S. Cl. 135—118 **5 Claims**



1. A hunting blind comprising:

a flat base panel having opposed first and second parallel edges;

a first flat side panel secured to said first edge of said base panel; and

a second flat side panel secured to said second edge of said base panel, said base and side panels being made of a single piece of lightweight biodegradable material, said first and second side panels being foldable to lie parallel to said base panel or to intermediate positions to lie at angles to said base panel, at least one surface of each of said panels having a camouflaged pattern thereon, said base and side panels each having a top and a bottom edge and wherein when said side panels are folded to said intermediate positions either said top edges or said bottom edges may be positioned on the earth's surface.

US 6,408,866 B1

FLUIDIC OSCILLATOR, PART DESIGNED TO BE INCORPORATED IN A FLUIDIC OSCILLATOR AND METHOD FOR MAKING SUCH A FLUIDIC OSCILLATOR

Andrew Carver, Seneca, S.C., and Luc Hernoux, Cisse, France, assignors to Schlumberger Industries, S.A., Montrouge, France

PCT No. PCT/EP99/03955, § 371 Date Feb. 26, 2001, § 102(e) Date Feb. 26, 2001, PCT Pub. No. WO99/66214, PCT Pub. Date Dec. 23, 1999

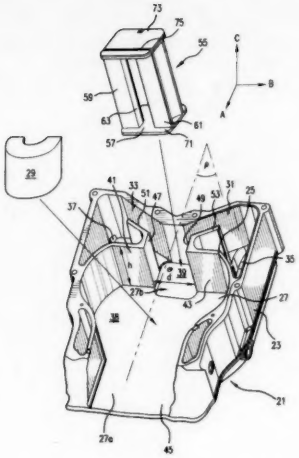
PCT Filed Jun. 8, 1999, Appl. No. 719,604

Claims priority, application France, Jun. 17, 1998, 98 07675

Int. Cl. G01F *1/20*

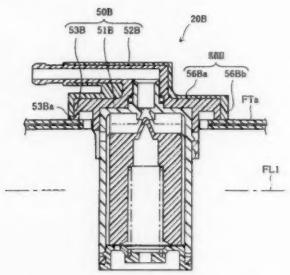
U.S. Cl. 137—15.01 **14 Claims**

1. A method of manufacturing a fluidic oscillator that is symmetrical about a longitudinal plane of symmetry, the oscillator comprising an enclosure defining an oscillation chamber and having an inlet opening and an outlet opening through which the fluid flows and which are in alignment in said plane of symmetry in a "longitudinal" first direction, said inlet opening being made in the form of a slot which is narrow in a second direction extending transversely to said plane of symmetry and elongate in a third direction parallel to said plane of symmetry and perpendicular to said longitudinal first direction, wherein the method consists in making said enclosure by forming therein a cavity of transverse size greater than the transverse size of said slot, in manufacturing separately a removable insert with higher precision than the enclo-



sure sand forming therein said slot, and in inserting said insert in said cavity.

US 6,408,867 B2
FUEL CUTOFF VALVE AND FUEL TANK
Tomohide Aoki; Hiroaki Kito; Hisatsugu Goto, and Masayuki Nakagawa, all of Aichi-ken, Japan, assignors to Toyoda Gosei Co., Ltd., Aichi-ken, Japan
Filed Mar. 15, 2001, Appl. No. 808,095
Claims priority, application Japan, Mar. 30, 2000, 2000-092903; Dec. 27, 2000, 2000-396453
Int. Cl. F16K *24/04*
U.S. Cl. 137—202 **16 Claims**



1. A fuel cutoff valve configured for partial insertion into a fixation hole formed in an upper tank wall of a fuel tank, the upper tank wall being made of a first resin material, the fuel cutoff valve comprising:

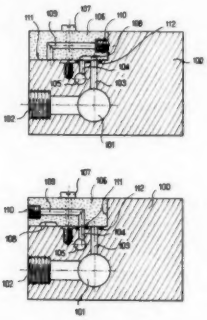
a cover including (i) a circular welding end, the cover being constructed and arranged to be thermally welded to the upper tank wall to surround a peripheral portion of the fixation hole and (ii) a fuel conduit constructed and arranged to connect to a location exterior to the cover;

a casing constructed of a second resin material having a greater fuel permeation-resistant property than the first resin material, the casing including a valve chest constructed and arranged to connect the fuel tank to the fuel conduit; and

a valve body positioned in the valve chest to open and close the fuel conduit according to a level of a liquid fuel in the fuel tank;

wherein the cover is constructed of a third resin material, the third resin material containing the first and second resin material such that the first material is dispersed a matrix of the second resin material.

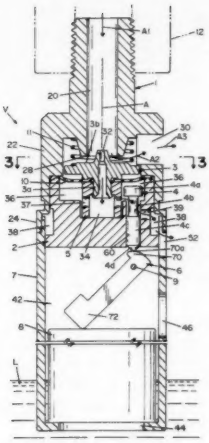
US 6,408,868 B2
INTERFACE MODULE FOR AN ISLAND OF ELECTROPNEUMATIC CONTROL VALVES
Serge Rondreux, Guichainville; Grégory Lucas, Evreux, and Daniel Bouteille, Viroflay, all of France, assignors to Parker Hannifin RAK SA, Annemasse, France
Filed Apr. 17, 2001, Appl. No. 835,552
Claims priority, application France, Apr. 17, 2000, 00 04918
Int. Cl. F16D *1/00*
U.S. Cl. 137—270 **6 Claims**



1. An interface module for an island of electropneumatic control valves on bases, the module comprising a body having at least one face for connection to a base of the island and, away from said base, means for coupling to at least a first external duct, said body having at least one internal main channel, a secondary channel, and a branch internal channel for connecting the main channel to the secondary channel, which branch channel is provided with a two-position selector which, depending on its position, provides continuity for the connection or interrupts it, wherein the selector has connection means for connecting the secondary channel to a second external duct, which means are accessible from outside the module when the selector is in its interruption position and are masked when the selector is in its continuity position.

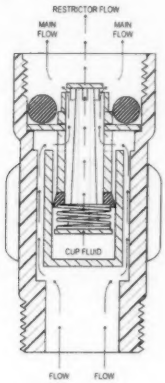
US 6,408,869 B1
SAFETY VALVE
Josef A. Bartos, Pomona, and Harsharan Grewal, Diamond Bar, both of Calif., assignors to GAAP Gas Control Inc., Pomona, Calif.
Provisional application No. 60/223,335, filed on Aug. 7, 2000. This application Jul. 2, 2001, Appl. No. 895,705.
Int. Cl. F16K *31/34;31/385*
U.S. Cl. 137—414 **5 Claims**

1. A liquid level responsive shut-off valve comprising a valve housing having a first end and an inlet passageway at said first end for connection to a source of liquid under pressure, said inlet passageway having an axis and an outlet end transverse to said axis, a diaphragm actuated valve element coaxial with said axis for opening and closing said outlet end, a spring biasing said diaphragm actuated valve element to open said outlet end, said housing including an outlet passageway laterally adjacent said outlet end for the flow of liquid from said housing when said outlet end of said inlet passageway is open, said diaphragm actuated valve element having a first side facing said outlet end of said inlet passageway and a second side opposite said first side, said housing including a liquid chamber on said second side coaxial with said axis and an outlet port for the flow of liquid in said chamber from said housing, said diaphragm actuated valve element including a flow passageway between said first and second sides and having an



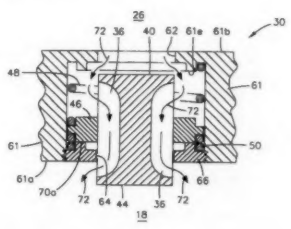
inlet end in flow communication with said inlet passageway and an outlet end in flow communication with said liquid chamber, said housing having a second end spaced from said first end, a float retainer mounted on said second end of said housing coaxial with said axis and providing a float chamber having an inner end adjacent said second end of said housing, a float in said float chamber, a float operated lever pivotally mounted in said float chamber between said float and said inner end of said float chamber, a lever operated valve element in said valve housing having open and closed positions for respectively opening and closing said outlet port to the flow of liquid from said liquid chamber through said outlet port in response to the position of said float in said float chamber, said lever operated valve element including an operating end extending from said housing into said float chamber, said lever having an actuating end and an opposite end spaced from said actuating end, said actuating end interengaging with said operating end of said lever operated valve element, said opposite end of said lever slidably engaging said float for said float to pivot said lever as the float ascends and descends in said float chamber, said float at a predetermined lower level in said float chamber engaging said opposite end of said lever for said actuating end of said lever to interengage with said operating end of said lever operated valve element to maintain said lever operated valve element in said open position thereof, whereby liquid under pressure from said source flows through said inlet passageway and through said flow passageway into said liquid chamber and out through said outlet port, said actuating end of said lever disengaging said operating end of said lever operated valve element when said float ascends in said float chamber to a predetermined upper level, whereby said lever operated valve element is released to close said outlet port and liquid under pressure flowing into said liquid chamber through said flow passageway from said inlet passage closes said diaphragm actuated valve element, and said actuating end of said lever including means interengaging with said operating end of said lever operated valve element when said float ascends in said float chamber to said predetermined upper level and the outlet port is closed, the weight of said lever being insufficient to displace said lever operated valve element against the fluid pressure in said fluid chamber to open said outlet port, whereby said means interengaging with said operating end maintains the float operated lever against displacement relative to said operating end as said float descends in said float chamber from said upper level and until said liquid under pressure in said liquid chamber and said inlet passageway is reduced to atmospheric pressure whereupon the weight of said lever displaces said lever operated valve element to open said outlet port.

US 6,408,870 B1
FLOW CONTROL VALVE
Robert D. Dulin, Kingsbury, Tex., assignor to Research by Copperhead Hill, Inc., Kingsbury, Tex.
Filed Aug. 31, 2001, Appl. No. 682,435
Int. Cl. F16K *21/06*
U.S. Cl. 137—462 **17 Claims**



1. A flow control valve comprising:
a cylindrical housing having inlet and outlet ends and a central portion therebetween;
a timing cup slidably disposed within the central portion;
a piston having a base and a top,
a spring surrounding the piston for urging the piston toward the inlet end; and
a flow regulator through which the piston is able to pass, the regulator further comprising a first portion having one or more inlet ports and a second portion separated from the first portion by an annular ridge.

US 6,408,871 B1
TWO WAY PRESSURE RELIEF VALVE
Michael R. Ryerson, Fall River, Mass., and Paul E. Moody, Barrington, R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sep. 6, 2000, Appl. No. 656,198
Int. Cl. F16K *17/196*
U.S. Cl. 137—493 **16 Claims**



1. A two-way valve comprising:
a valve body having a first aperture formed therein and a lateral aperture formed therein, said first aperture being coaxial and in communication with said lateral aperture;
a retaining ring secured in said lateral aperture and having a second aperture extending through said retaining ring;
a central portion having an annular rim portion disposed in said lateral aperture of said valve body, a first end portion at one end of said central portion provided with a first end surface extending in said first aperture of said valve body, and second

end portion at the opposite end of said central portion provided with a second end surface extending in said second aperture;

a first biasing spring in said lateral aperture between said valve body and a first side of said annular rim portion; and

a second biasing spring in said lateral aperture between a second side of said annular rim portion and said retaining ring, said first and second biasing springs holding said first end surface coplanar with a top surface of said valve body and said second end surface coplanar with a bottom surface of said valve body.

US 6,408,872 B1

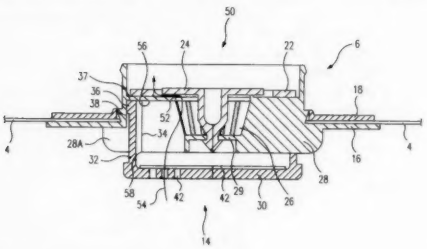
EVACUABLE CONTAINER HAVING ONE-WAY VALVE WITH FILTER ELEMENT

Janet L. Skeens, San Carlos, and Gerald W. Sweeney, La Jolla, both of Calif., assignors to New West Products, Inc., San Diego, Calif.

Continuation-in-part of application No. 08/851,361, filed on May 5, 1997, now Pat. No. 5,931,189, which is a continuation of application No. 08/423,761, filed on Apr. 17, 1995, now abandoned, which is a division of application No. 08/168,963, filed on Dec. 15, 1993, now Pat. No. 5,480,030. This application May 12, 1999, Appl. No. 310,468.

Int. Cl. F16K *15/14;* **B65D** *81/20*

U.S. Cl. 137—512.15 **11 Claims**



1. A container comprising:

a flexible, air-tight bag having an opening for inserting an item to be stored into said bag;

an air-tight seal across said opening;

a one-way valve assembly installed in a surface of said bag, wherein said valve assembly comprises a plurality of vanes and allows air to pass out of said bag but prevents air from entering said bag; and

a filter assembly mated with said valve assembly, wherein said filter assembly has at least one hole formed therein and supports a filter element across said at least one hole such that air passing out of said bag through said valve assembly is filtered, and wherein said filter assembly is configured to fit over, and form a seal with, said vanes.

US 6,408,873 B1

PISTON-TYPE FLUSH VALVE HAVING A TRIPLE FILTERED BYPASS

David C. Hall, Wheaton, and Martin E. Marcichow, Hoffman Estates, both of Ill., assignors to Sloan Valve Company, Franklin Park, Ill.

Filed Jul. 24, 2000, Appl. No. 625,033

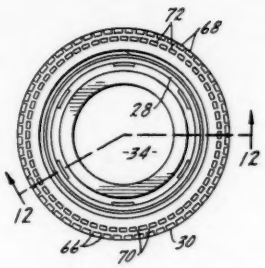
Int. Cl. F16K *31/385;* **E03B** *7/07*

U.S. Cl. 137—550 **8 Claims**

1. A flush valve for use with urinals or water closets including:

a hollow valve body having an inlet, an outlet and a valve seat between the inlet and the outlet;

a piston assembly movable in said hollow valve body to a closing position on said valve seat to control fluid flow between said inlet and said outlet;



a pressure chamber above the piston assembly for holding said piston assembly on said valve seat; and

a bypass passage through said piston assembly to fluidly connect said inlet with said pressure chamber to provide fluid to move said piston assembly to said closing position, the bypass passage including filtering means and an orifice, said filtering means including multiple filters in fluid flow series connecting said inlet with said orifice, said multiple filters including a plurality of individual filtering slots disposed in a plurality of concentric annular arrays, the cross sectional opening of the individual filtering slots in each annular array being smaller than the cross sectional openings of the individual filtering slots of the concentrically adjacent array of filtering slots, the individual filtering slots in the annular arrays being radially oriented and circumferentially offset from the individual filtering slots in the concentrically adjacent annular array of filtering slots.

US 6,408,874 B1

DEVICE FOR REDUCING SPLASH NOISES IN A FUEL TANK

Dieter Keller, Aschaffenburg, Germany, assignor to Mannesmann VDO AG, Germany

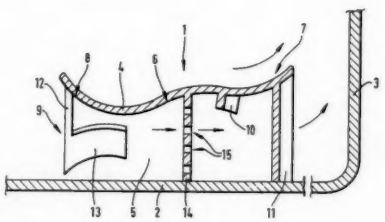
PCT No. PCT/EP98/00458, § 371 Date Nov. 5, 1999, § 102(e) Date Nov. 5, 1999, PCT Pub. No. WO98/36929, PCT Pub. Date Aug. 27, 1998

PCT Filed Jan. 29, 1998, Appl. No. 367,655

Claims priority, application Germany, Feb. 20, 1997, 197 06 658

Int. Cl. B60K *15/077*

U.S. Cl. 137—574 **6 Claims**



1. A device for the reduction of splashing noises in a fuel tank of a motor vehicle, with damping elements arranged in the fuel tank, wherein the damping elements having various orientations in the tank as a whole are designed as guide elements and/or guide plates for deflecting the flow of fuel onto a wall of the fuel tank at an angle different from 90° and/or for throttling the velocity of the flow, and wherein the guide plates form relative to one another a channel.

US 6,408,875 B1

PIPING STRUCTURE OF A WORKING MACHINE

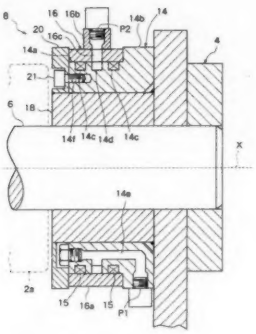
Hiroyasu Nishikawa; Takahiro Iwamoto, both of Tokyo, and Toshiyuki Matsumoto, Osaka, all of Japan, assignors to Shin Caterpillar Mitsubishi Ltd., Tokyo, Japan

Continuation of application No. PCT/JP00/06648, filed on Sep. 27, 2000. This application Oct. 10, 2001, Appl. No. 973,051.

Claims priority, application Japan, Mar. 13, 2000, 2000-68518

Int. Cl. F16L *27/087;* **B66C** *23/00*

U.S. Cl. 137—580 **6 Claims**



1. A piping structure of a working machine, comprising a swivel joint which is a rotary joint for fluid and is disposed, on the outer side in the radial direction of a shaft of a coupling portion where a pair of members are swingably coupled together via said shaft, so as to swing on the axis of swinging motion as a center of rotation.

US 6,408,876 B1

CONTROL VALVE

Yoshizumi Nishimura, Tsuchiura; Yusaku Nozawa, Ibaraki-gun; Kinya Takahashi, Tsuchiura, and Mitsuhisa Tougasaki, Niihari-gun, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

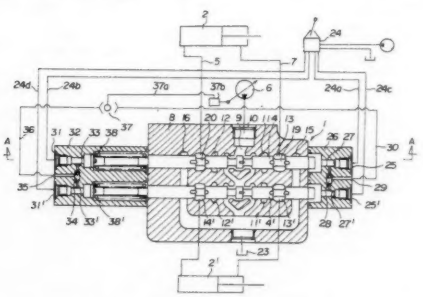
PCT No. PCT/JP99/06695, § 371 Date Oct. 13, 2000, § 102(e) Date Oct. 13, 2000, PCT Pub. No. WO00/32970, PCT Pub. Date Jun. 8, 2000

PCT Filed Nov. 30, 1999, Appl. No. 601,251

Claims priority, application Japan, Dec. 1, 1998, 10-341890

Int. Cl. F16K *11/24*

U.S. Cl. 137—596.15 **6 Claims**



1. A control valve provided with a plurality of spools movably arranged within a valve body, movements of said spools being effected by pilot pressures, respectively, characterized in that:

a shuttle valve for selecting higher one of said pilot pressures, which cause said spools to move, respectively, is arranged within a main body of said control valve.

US 6,408,877 B2

DIRECTIONAL CONTROL VALVE

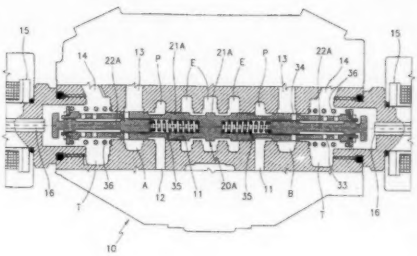
Mario Venditti, Bologna, and Luca Ibatici, Rivalta, both of Italy, assignors to Bucher Hidroirma S.p.A., Reggio Emilia, Italy

Filed Dec. 12, 2000, Appl. No. 733,923

Claims priority, application Italy, Dec. 14, 1999, RE99A0134

Int. Cl. F15B *13/044*

U.S. Cl. 137—596.17 **5 Claims**



1. A directional control valve comprising:

a valve body having a main bore on which there are provided a plurality of channels connected to respective fluid entry, exit and utilization passages,

a slider-valving member (**20**, **20**A, **20**B) axially movable within said main bore, to assume a number of different axial positions, of which one is a central normal position, and having a normal configuration by which, when in said axial positions, it determines that number of different conditions of communication between the channels, to control the flow direction, two thrust means (**15**) applied to the respective ends of the slider-valving member (**20**, **20**A, **20**B), to act one at a time in order to move the slider-valving member about its central normal position, through a determined distance in a respective direction, to which a respective operative position corresponds, characterized in that the slider-valving member comprises two lateral valving elements (**22**, **22**A, **22**B) positioned on one and the other side of the transverse central plane through said slider-valving member (**20**, **20**A, **20**B), these being subjected to the direct action of the thrust means (**15**). and movable axially between a first operative position defining said normal configuration of the slider-valving member (**20**, **20**A, **20**B), and a second operative position in which a further different communication condition between the channels is determined,

and spring means (**23**, **35**, **45**) arranged to normally maintain the two lateral valving elements (**22**, **22**A, **22**B) in said first operative position;

said thrust means (**15**) being operated either individually or simultaneously, their action being such that when they act individually on the slider-valving member (**20**, **20**A, **20**B), this maintains its normal configuration, whereas when they act simultaneously on the lateral valving elements (**22**, **22**A, **22**B), these are moved into said second operative position against the action of the spring means (**23**, **35**, **45**);

wherein the slider-valving member (**20**, **20**A) comprises a central valving element (**21**, **21**A), to the ends of which said two lateral valving elements (**22**, **22**A) are secured such that they can be moved, relative to the central valving element (**21**, **21**A), into the two said end positions.

US 6,408,878 B2

MICROFABRICATED ELASTOMERIC VALVE AND PUMP SYSTEMS

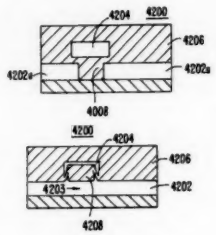
Marc A. Unger, South San Francisco; Hou-Pu Chou; Todd A. Thorsen, both of Pasadena; Axel Scherer, Laguna Beach, and Stephen R. Quake, San Marino, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of application No. 09/605,520, filed as application No. PCT/US00/17740, filed on Jun. 27, 2000, Provisional application No. 60/106,856, filed on Mar. 3, 2000, Provisional application No. 60/147,199, filed on Aug. 3, 1999, Provisional application No. 60/141,503, filed on Jun. 28, 1999. This application Feb. 28, 2001, Appl. No. 796,666.

This patent is subject to a terminal disclaimer.

Int. Cl. F16K *11/20*

U.S. Cl. 137—597 **23 Claims**



1. A microfabricated elastomeric structure, comprising:

an elastomeric block formed with microfabricated recesses having a width less than 1000 μm therein, a portion of the elastomeric block is deflectable into one of the recesses when the portion is actuated.

US 6,408,879 B1

FLUID CONTROL DEVICE

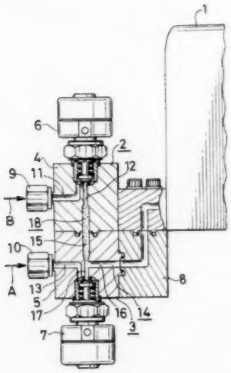
Tadahiro Ohmi, Sendai; Yukio Minami, Osaka; Akihiro Morimoto, Osaka; Nobukazu Ikeda, Osaka; Keiji Hirao, Osaka; Takashi Hirose, Osaka; Michio Yamaji, Osaka, and Kazuhiro Yoshikawa, Osaka, all of Japan, assignors to Tadahiro Ohmi, Miyagi, and Fujikin Incorporated, Osaka, both of Japan

Filed Aug. 3, 1998, Appl. No. 127,817

Claims priority, application Japan, Aug. 5, 1997, 9-210254

Int. Cl. F16K *11/00*

U.S. Cl. 137—606 **1 Claim**



1. A fluid control device for selectively passing different fluids alternately to a massflow controller, comprising:

lower and upper on-off valves including a lower valve body and an upper valve body disposed in mutually opposed integral relation,

selectively operated actuator attached to each of said valve bodies for controlling fluid flow through the respective on-off valves,

said lower valve body containing an inflow channel for conducting a first fluid from an exterior of said fluid control device to the actuator attached to said lower valve body,

said upper valve body containing an inflow channel for conducting a second fluid from an exterior of said fluid control device to the actuator attached to said upper valve body,

an outflow channel in said upper valve body having one end communicating with said actuator in said upper valve body and its other end penetrating a lower end of said upper valve body and said outflow channel being lineally straight between said actuator and said lower end of said valve body,

a by-pass channel portion in said lower valve body having one end penetrating an upper end of said lower valve body and connecting with said other end of said outflow channel in said upper valve body and another end spaced closely adjacent said actuator in said lower valve body, a fluid sub-passageway in said lower valve body communicating at one end with said actuator in said lower valve body and at its other end with the other end of said by-pass channel portion, said fluid sub-passageway and said by-pass channel portion being in axial alignment through said lower valve body,

a main passageway from said fluid control device to said massflow controller being disposed in said lower valve body and having one end communicating at the point of connection between said by-pass channel portion and said fluid sub-passageway in said lower valve body, and its other end opening from said lower valve body,

said first fluid flowing in through said inflow channel of said lower valve body being fed to said massflow controller via said sub-passageway of said lower valve body and said main passageway of said lower valve body, and

said second fluid flowing in through said inflow channel of said upper valve body being fed to said massflow controller via said outflow channel of said upper valve body, said by-pass channel portion of said lower valve body and said main passageway of said lower valve body.

US 6,408,880 B1

PLUG-IN COUPLING FOR CONNECTING PIPELINES, HOSES OR SIMILAR

Wolfgang Kaul, Wuppertal, Germany, assignor to Carl Kurt Walther GmbH & Co. KG, Haan, Germany

PCT No. PCT/EP00/02113, § 371 Date Jan. 12, 2001, § 102(e) Date Jan. 12, 2001, PCT Pub. No. WO00/55537, PCT Pub. Date Sep. 21, 2000

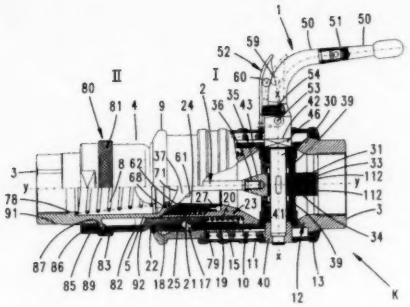
PCT Filed Mar. 10, 2000, Appl. No. 700,255

Claims priority, application Germany, Mar. 13, 1999, 199 11 208

Int. Cl. F16L *29/00*

U.S. Cl. 137—614.06 **89 Claims**

11. Plug-in coupling (K) for connecting pipelines or tubes, having a valve body (**2**) which is disposed in one of two coupling parts (I, II) and is actuatable from the outside, and having a locking sleeve (**9**) which is displaceable from a locking position, in which a plugged-together position of the two coupling parts (I, II) is secured by spring loading, into a release position, wherein external actuation of the valve body (**2**) in a release position of the locking sleeve (**9**), which is retained there despite the spring loading, and displacement of said locking sleeve into the release position in an open position of the valve body (**2**), are blocked, wherein the external actuation is a rotary actuation effecting a longitudnal displacement of the valve body (**2**), and wherein rotary-actuation axis (x—x) carries a semicircularly-formed locking protrusion (**42**) which is located concentrically with the axis and with which a guide slot (**43**) of the locking sleeve (**9**) is associated, such that, in a release position of the locking sleeve (**9**), the semicircular profile



of the locking protrusion (**42**) enters into the guide slot (**43**) with engagement on both sides and, in a release position of the locking sleeve (**9**), arcuate surface (**44**) of said semicircular profile, entering into a free space (**48**), moves into the guide slot (**43**) in front of a blocking flank (**49**), to a side of the guide slot.

US 6,408,881 B2

FAUCET DEVICE TO DELIVER AND MIX WATER

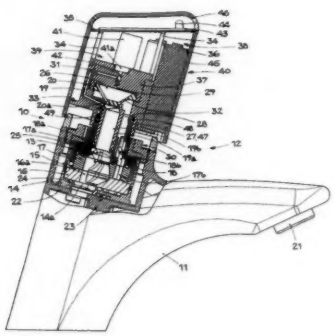
Mauro Lorenzelli, Bergamo, and Gabriele Sarasini, Bovegno, both of Italy, assignors to Nuova Galatron Srl, Castiglione Delle Stiveiere (MN), Italy

Filed Jan. 25, 2001, Appl. No. 769,110

Claims priority, application Italy, Jan. 25, 2000, UD00A0012

Int. Cl. F16K *31/02;* **C03C** *1/05*

U.S. Cl. 137—624.11 **21 Claims**



1. A device to deliver and mix water for a tap (**12**), said device comprising a mixer cartridge (**30**), arranged inside a monoblock (**11**) of the tap (**12**), a handle (**45**) operationally associated with the mixing cartridge (**30**) to regulate the mixing of the water, an actuation device, arranged above said monoblock (**11**), which controls an opening and closing of a flow of water through the mixing cartridge, said actuation device being commanded electrically and controlling a membrane (**20**) which cooperates with said mixer cartridge (**30**) to allow flow of water through said mixing cartridge (**30**).

3. Device as in claim, **1** characterized in that said actuation device is commanded by drive means associated with at least a presence sensor (**44**).

8. Device as in claim **3**, characterized in that timer means are associated with said drive means (**41**) in order to automatically de-activate said drive means (**41**) after a pre-determined time from when said sensor (**44**) detects the presence of a user.

US 6,408,882 B1

DIVERTER VALVE

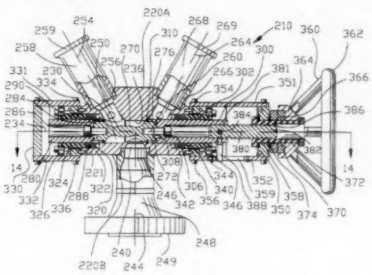
Walter L. Smith, Jr., 2111 Foxfire La., DeLand, Fla. 32720

Provisional application No. 60/164,126, filed on Nov. 8, 1999.

This application Nov. 8, 2000, Appl. No. 709,129.

Int. Cl. F16K *11/10*

U.S. Cl. 137—625.34 **16 Claims**



1. An improved diverter valve, comprising;

a valve housing defining internal chamber, wherein said internal chamber is substantially cylindrical having cylindrical sidewalls;

a main port communicating with said internal chamber of said valve housing;

a first and second port communicating with said internal chamber of said valve housing;

said main port communicating with said first and second ports in a Y-shaped configuration,

a valve element slidably disposed in said internal chamber;

an actuator for sliding said valve element from a first position whereat said main port is in fluid communication with said first port to a second position whereat said main port is in fluid communication with said second port for diverting fluid between said main port and said first port and said main port and said second port;

said valve element having a substantially cylindrical first and second end and having a cylindrical axis extending therethrough;

an intermediate valve element portion interconnecting said first cylindrical end and said second cylindrical end of said valve element;

said intermediate valve element portion defining a first and a second lateral region;

said first and second lateral regions cooperating with said cylindrical internal chamber cylindrical sidewalls for providing a valve internal volume; and

said valve internal volume enabling said main port fluid communication through said valve internal volume to said first port with valve element in a first position and said main port fluid communication through said valve internal volume to said second port with valve element in a second position.

US 6,408,883 B2

ELECTROMAGNETIC VALVE

Atsushi Motoki, Kariya, and Motoyoshi Ando, Nagoya, both of Japan, assignors to Denso Corporation, Japan

Filed Jan. 25, 2001, Appl. No. 768,223

Claims priority, application Japan, Jan. 26, 2000, 2000-017018

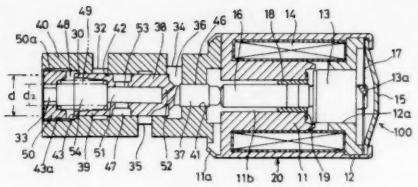
Int. Cl. F15B *13/043;13/044*

U.S. Cl. 137—625.64 **7 Claims**

1. An electromagnetic valve comprising:

an electromagnetic driving portion having a plunger reciprocally driven in accordance with a supplied electric current;

a sleeve axially connected with the electromagnetic driving portion, the sleeve having a generally cylindrical wall that defines an axially extending through hole, and a plurality of first fluid passages passing therethrough, the first fluid pas-



sages defining an input port and a discharge port, the axially extending through hole including a first portion in which the input and discharge ports are located, a second portion located adjacent the electromagnetic driving portion, a third portion located close to an end of the sleeve which is remote from the electromagnetic driving portion, and a feedback chamber located between the first portion and the second portion, the second portion having a smaller inner diameter than that of the first portion, the third portion having a larger inner diameter than that of the first portion, the sleeve further defining a second fluid passage as an output port which opens at an axial end of the sleeve;

a spool defining a third fluid passage which communicates with the second fluid passage, the spool being a slidably supported in the cylindrical wall of the sleeve and reciprocally operated by the plunger to vary a flow rate of fluid between the input port and the output port and between the discharge port and the output port, the spool being composed of smaller diameter portions than the third portion of the axially extending through hole to be insert into the sleeve from the third portion, and having a first land located in the first portion to control the flow rate between the input port and the output port and between the discharge port and the output port, and a second land located in the second portion; and

urging means disposed in the third portion of the sleeve for urging the spool against the plunger.

US 6,408,884 B1

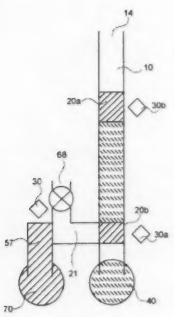
MAGNETICALLY ACTUATED FLUID HANDLING DEVICES FOR MICROFLUIDIC APPLICATIONS

Andrew Kamholz; Anson Hatch; Karl Böhringer; Paul Yager, and Berhard Weigl, all of Seattle, Wash., assignors to University of Washington, Seattle, Wash.

Filed Dec. 15, 1999, Appl. No. 464,379

Int. Cl. F15C *1/08*

U.S. Cl. 137—827 **13 Claims**



1. A fluid handling device comprising:

at least one microsized flow channel in fluid communication with at least one fluid inlet and at least one fluid outlet; and

one or more slugs of magnetic fluid located within the flow channel, wherein a slug can be held stationary or moved in the channel by at least one magnet and wherein a slug blocks fluid flow through the channel when it is stationary and a slug pulls or pushes fluid through the channel when it is moved;

said device also comprising at least one slug inlet in fluid communication with the flow channel for conducting the slug into the flow channel.

US 6,408,885 B2

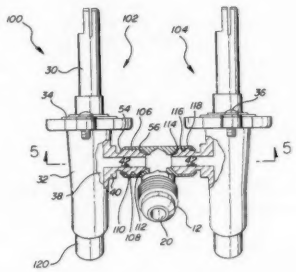
STAKED DUAL VALVE ASSEMBLY

William L. Hillis, Lawrenceburg, Tenn., assignor to Lincoln Brass Works, Inc., Hendersonville, Tenn.

Continuation of application No. 09/232,547, filed on Jan. 18, 1999, now Pat. No. 6,199,589. This application Feb. 15, 2001, Appl. No. 784,753.

Int. Cl. F16K *27/00*

U.S. Cl. 137—883 **23 Claims**



1. A valve and manifold assembly for use with a gas grill, the assembly comprising:

a manifold having an inlet member and a pair of integral outwardly extending valve ports, each valve port having an internal surface with a first beveled shoulder; and

a first one-piece valve having a body and an integral neck, the neck fitting into the manifold and having a flattened extended portion that extends substantially within and sealingly engaging a flat portion of one of the valve ports, the body having an internal fluid passage, a longitudinal axis extending through the internal fluid passage, the neck extending normal to the longitudinal axis and the flatten extended portion sealingly engaging a substantial portion of the internal surface of one of the valve ports of the manifold.

US 6,408,886 B1

DRIVE ATTACHMENT FOR THE DISCHARGE VALVE OF A RECREATIONAL VEHICLE

Arthur J. Milano, Jr., Burlington, and Herman J. Parent, Winsted, both of Conn., assignors to Seitz Corporation, Torrington, Conn.

Filed Aug. 6, 2001, Appl. No. 922,569

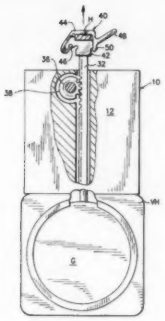
Int. Cl. F16K *31/04*

U.S. Cl. 137—899 **3 Claims**

1. A retrofit electro-mechanical actuator assembly for the remote operation of a manually operable tank drain valve installed on a recreational vehicle, the drain valve having a housing enclosing a linearly sliding gate with an open and a closed position at the extremes of its travel and a manually operable T-shaped valve handle attached thereto which slides in a linear, bi-directional manner to move the sliding gate between its open and closed positions, the assembly comprising:

a. resilient housing comprising a back wall and connected side walls arranged in channel-shape in horizontal cross-section and having inward detents along the distal ends of the side walls, the detents comprising attachment means for removably securing the housing to the drain valve;

b. a rack reciprocally supported by the housing;



c. a reversible electric drive motor selectively powered to produce clockwise or counter-clockwise rotational drive, and unpowered to place it in a stationary, disabled state, the motor having a pinion engaging the rack and adapted to impart reciprocal drive thereto and supported by the housing;

d. a handle-securing fastener at the upper end of the rack comprising a base adapted to fit against the underside of a wing of the T-shaped handle and a resilient clip having an end hinged to the base and adapted to swing over the top of the wing and having a latch at the other end of the clip adapted to snap closed under the underside of a portion of the base to enclose the wing and attach the rack to the handle.

US 6,408,887 B2

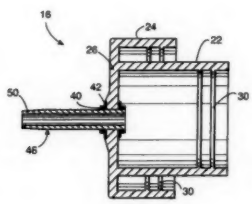
DUAL SIZE PLUMBING END CAP

Rick Rahimzadeh, 6246 Sale Ave., Woodland Hills, Calif. 91367, and John Hanna, 155 Cathy Dr., Newberry Park, Calif. 91320

Provisional application No. 60/198,136, filed on Apr. 17, 2000. This application Apr. 17, 2001, Appl. No. 836,007.

Int. Cl. F16L *55/10*

U.S. Cl. 138—96 R **30 Claims**



1. A plumbing end cap, comprising:

a fluid impervious membrane;

a first cylindrical wall extending from the membrane and configured to envelop an end of a first pipe having a first diameter and, cooperatively with the membrane, seal the end of the first pipe; and

a second cylindrical wall associated with the membrane having a diameter which is larger than the first cylindrical wall and configured to envelop an end of a second pipe having a second diameter and, cooperatively with the membrane, seal the end of the second pipe;

wherein the first and second walls extend from the same surface of the membrane so as to be concentric, the first wall being of a greater length than the second wall; and wherein inner surfaces of the first and second walls include protruding ridges configured to secure the first or second walls to the end of the first or second pipe.

US 6,408,888 B1

ENERGY CONDUCTING GUIDE CHAIN

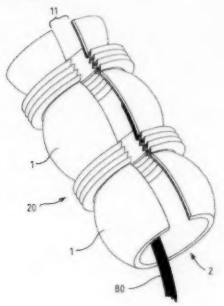
Jürgen Bäumer, Siegen; Herbert Wehler, Neunkirchen, and Werner Eul, Troisdorf, all of Germany, assignors to Kabelschlepp GmbH, Siegen, Germany

Filed Mar. 30, 2000, Appl. No. 538,462

Claims priority, application Germany, Apr. 1, 1999, 199 15 035

Int. Cl. F16L *11/00;* **F16G** *13/00;13/10*

U.S. Cl. 138—120 **22 Claims**



1. A guide element for an energy conducting guide chain comprising

a generally tubular body which defines a longitudinally extending central guide area which is adapted to receive at least one energy conducting line, and which includes first and second longitudinally aligned guide sections which are joined by a flexible intermediate joint section, with the first guide section being configured for coupling engagement with the second guide section of another substantially corresponding guide element to form a chain of longitudinally aligned guide elements, and wherein each of the first and second guide sections has the configuration of a segment of a sphere.

US 6,408,889 B1

BENDABLE TUBE AND METHOD FOR MANUFACTURING THE SAME

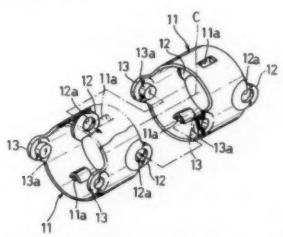
Yuichi Komachi, Akishima, Japan, assignor to Machida Endoscope Co., Ltd., Japan

Filed Sep. 25, 2000, Appl. No. 669,110

Claims priority, application Japan, Oct. 8, 1999, 11-288004

Int. Cl. F16L *11/18*

U.S. Cl. 138—120 **2 Claims**



1. A method for manufacturing a bendable tube for an endoscope, a catheter, or the like having a plurality of joint pieces which are made of metal and arranged in a row, said method comprising the steps of:

(a) preparing said joint pieces each of which has a tubular configuration, each of said joint pieces being provided at one end portion thereof with a pair of first connecting portions and at the other end portion with a pair of second connecting portions, said first connecting portions being projected in a center axis direction of said joint piece and arranged 180 degrees away from each other in a peripheral direction, said

second connecting portions being projected in the opposite direction to said first connecting portions and arranged 180 degrees away from each other in the peripheral direction, said first connecting portions each being formed with a through-hole;

(b) in said joint pieces to be placed adjacent to each other, radially externally overlapping said second connecting portion of one of said adjacent joint pieces with said first connecting portion of the other adjacent joint piece; and

(c) in the overlapped condition of said first and second connecting portions, pressing said second connecting portion from outside, thereby forming a protrusion projected inward in a radial direction and simultaneously fitting said protrusion into said through-hole, said joint pieces being rotatably connected together only by this fitting engagement between said protrusion and said through-hole.

US 6,408,890 B1

HOSE CONNECTING STRUCTURE

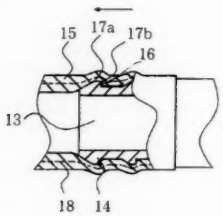
Hiroyoshi Mori, Iwakura, Japan, assignor to Tokai Rubber Industries, Ltd., Komaki, Japan

Filed Oct. 18, 2000, Appl. No. 690,894

Claims priority, application Japan, Oct. 26, 1999, 11-304005

Int. Cl. F16L *11/08*

U.S. Cl. 138—126 **19 Claims**



1. A structure comprising a flexible hose and a hard pipe,

the hose having a wall with a reinforcing fiber layer and an inside diameter which is expanded by from 30 to 50% at one end, and

the hard pipe having a portion press fitted in said one end of the hose, an annular stop projection formed about its press fitted portion, and a cross sectional contour including a gentle outward slope extending from the front end of said projection toward the rear end side to a first corner, which makes the angle of the subsequent second corner gentle, and a rear face of said second corner extending inwardly toward the longitudinal axis of said pipe at right angles thereto;

and said reinforcing fiber layer is of reinforcing yarn having a pull-out thread strength of at least 0.3 N/mm.

US 6,408,891 B1

FLEXIBLE PIPE FOR STATIC USE IN A CORROSIVE AMBIENCE

Patrice Jung, Hameau de Caveaumont; José Mallen Herrero, Paris; Jean-Marc Leroy, Rueil Malmaison, and Xavier Longaygue, Noisy le Grand, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison Cedex, and Coflexip, Paris, both of France

PCT No. PCT/FR99/00361, § 371 Date Aug. 16, 2000, § 102(e) Date Aug. 16, 2000, PCT Pub. No. WO99/42754, PCT Pub. Date Aug. 26, 1999

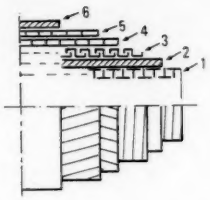
PCT Filed Feb. 17, 1999, Appl. No. 622,364

Claims priority, application France, Feb. 18, 1998, 98 01944

Int. Cl. F16L *11/10*

U.S. Cl. 138—127 **7 Claims**

1. A flexible tubular pipe intended to carry fluids under pressure containing H_2S, said pipe comprising a body, an internal sealing



sheath, at least one steel armouring layer withstanding stresses induced by the inside/outside pressure difference, at least one tension-resisting steel armouring layer spirally wound at an angle less than 45° in relation to the axis of the pipe, characterized in that at least said armouring layer withstanding stresses induced by the inside/outside pressure difference is made of a determined steel meeting H_2S resistance criteria, and in that at least said tension-resisting armouring layer is made from steel wires that do not meet H_2S resistance criteria.

US 6,408,892 B1

CAR VACUUM HOSE

Takeshi Kondo; Isamu Terasawa, both of Tokyo; Hiroshi Tanaka, Kanagawa-ken; Toshinori Ishii, Kanagawa-ken, and Yoshihiro Ishii, Kanagawa-ken, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

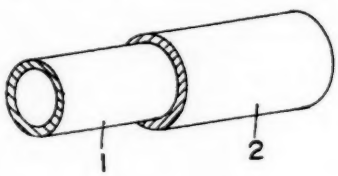
PCT No. PCT/JP99/07184, § 371 Date Aug. 28, 2000, § 102(e) Date Aug. 28, 2000, PCT Pub. No. WO00/40884, PCT Pub. Date Jul. 13, 2000

PCT Filed Dec. 21, 1999, Appl. No. 622,064

Claims priority, application Japan, Dec. 28, 1998, 10-372761

Int. Cl. F16L *11/04*

U.S. Cl. 138—137 **6 Claims**



1. A car hose comprising an inner layer as an inside layer and an outer layer disposed on an outer peripheral surface of the inner layer, wherein an olefin thermoplastic elastomer comprising polypropylene (PP) and acrylonitrile-butadiene rubber (NBR) is used in the inner layer, and an olefin thermoplastic elastomer comprising polypropylene (PP) and ethylene-propylene-diene rubber (EPDM) is used in the outer layer wherein the hose is manufactured by extrusion molding without vulcanizing.

US 6,408,893 B1

TUBULAR BAG WITH VENTILATION BANDS AND METHOD OF MAKING

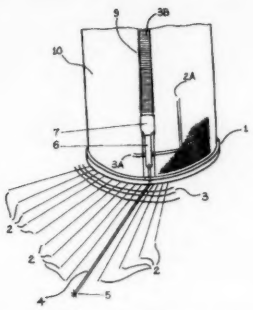
Ching-Lin Wang, Oakland, Calif., assignor to Eagle Bag Corporation, Oakland, Calif.

Provisional application No. 60/228,318, filed on Aug. 25, 2000. This application Aug. 24, 2001, Appl. No. 939,336.

Int. Cl. D03D *41/00*

U.S. Cl. 139—11 **6 Claims**

1. A method of manufacturing a specialty tubular bag wherein the tubular bag wall has at least one venting band extending along a length of a corresponding tubular sheet, said method comprising the steps of:



weaving a tubular sheet of flexible material with a circular loom to form an elongated tube comprising woven warp and weft strands, with said tubular sheet having a longitudinal axis parallel to said warp strands and a transverse axis parallel to said weft strands;

adapting, during said weaving step with said circular loom, at least one expansion block disposed with an associated means of fixturing said expansion block around a periphery of a concentration ring of said circular loom whereby said expansion block is used to replace a corresponding group of otherwise normally supplied warp strands to be woven;

creating, along the periphery of the woven tubular sheet, a set of said venting bands each corresponding to the location of an expansion block, where each venting band runs parallel to said longitudinal axis, said weft strands and said warp strands surrounding the said expansion block;

sectioning off said tubular sheet along a set of lines perpendicular to said longitudinal axis and with a predetermined spacing to form a set of tubular segments, whereby each said tubular segments comprising said set of venting bands extending longitudinally from a first open end to a second open end with the first open end of said tubular sheet named the top opening and the second open end of said tubular sheet named the bottom opening; and

sewing said bottom opening of said tubular sheet closed along a direction perpendicular to the said longitudinal axis with said top opening of said tubular sheet left open forming a desired bag opening.

US 6,408,894 B1

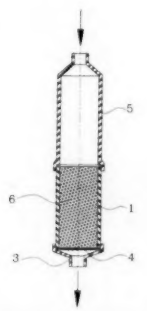
METHOD OF PRODUCING DEVICES FOR BLOOD PURIFICATION

Vadim Davankov, Moscow, Russian Federation, assignor to RenalTech International, LLC, New York, N.Y.

Filed Apr. 25, 2001, Appl. No. 840,890

Int. Cl. B65B *1/20*

U.S. Cl. 141—12 **9 Claims**



1. A method of producing a device for purifying blood from toxins, comprising the steps of providing a container with an inlet and an outlet; preparing a mixture of a porous beaded adsorbent polymeric material with a liquid; and supplying the mixture forcedly through said inlet into an interior of said container so that the liquid is squeezed out of the mixture and leaves the container through said outlet, while porous beads of the beaded polymeric material are homogeneously and densely packed in an interior of the container.

US 6,408,895 B1

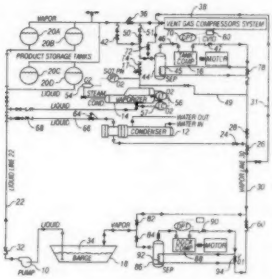
VAPOR CONTROL SYSTEM FOR LOADING AND UNLOADING OF VOLATILE LIQUIDS

Craig A. Beam, c/o Propax Corporation 7723 Wycomb La., Houston, Tex. 77070-3730

Provisional application No. 60/153,751, filed on Sep. 13, 1999. This application Sep. 12, 2000, Appl. No. 660,272.

Int. Cl. B65B *1/04*

U.S. Cl. 141—59 **13 Claims**



1. In a system for pumping liquid from a first vessel to a second vessel comprising a line connecting the first and second vessels and a pump for pumping liquid from the first vessel to the second vessel through the line, the improvement comprising:

a vapor line connecting the second vessel and the first vessel;

a compressor for pulling vapor off the second vessel and rotating the vapor to the first vessel through said vapor line; and

a vaporizer in fluid communication with the line through which liquid is pumped and the vapor line for increasing the volume of vapor routed to the first vessel for pressure balancing the first vessel as liquid is pumped from the first vessel.

US 6,408,896 B1

COOLANT CIRCULATING APPARATUS WITH AUTOMATICALLY RECOVERING MECHANISM

Mitsuhiro Watanabe; Masaki Noguchi, and Yoshiaki Sueoka, all of Ibaraki, Japan, assignors to SMC Corporation, Tokyo, Japan

Filed Nov. 29, 2001, Appl. No. 995,612

Claims priority, application Japan, Dec. 13, 2000, 2000-379043

Int. Cl. B65B *1/04*

U.S. Cl. 141—59 **4 Claims**

1. A coolant circulating apparatus with an automatically recovering mechanism, said apparatus comprising:

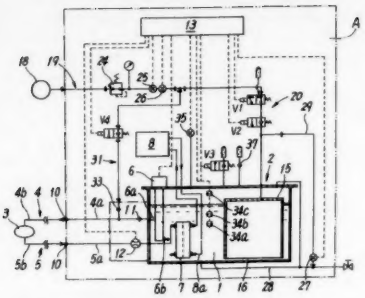
a hermetically sealed tank in which a coolant at a controlled temperature is housed;

a heat load connected to said tank through a feed pipe and a return pipe;

a pump for supplying said coolant in said tank to said heat load through said feed pipe and said return pipe in a circulating manner;

a liquid level regulating chamber communicating through a bottom portion thereof with an inside of said tank;

a compressed gas supply source for supplying compressed gas;



a liquid level regulating gas duct including a duct connecting said compressed gas supply source and said liquid level regulating chamber and a solenoid valve connected in said duct to regulate a liquid level of said coolant in said tank by causing said coolant to flow out into said tank from said liquid level regulating chamber or to flow into said liquid level regulating chamber from said tank by switching said solenoid valve to supply or discharge said compressed gas to and from said liquid level regulating chamber;

a recovery gas duct including a duct connecting said compressed gas supply source and said feed pipe and a solenoid valve connected in said duct to cause said coolant building up in said feed pipe, said heat load, and said return pipe to flow back into said tank by switching said solenoid valve to supply said compressed gas to said feed pipe;

a solenoid valve connected to a vapor phase portion of said tank to open said vapor phase portion to an outside in regulation of said liquid level of said coolant;

a level switch provided in said tank to detect said liquid level of said coolant;

a flowmeter connected to said return pipe to detect a flow rate of said coolant flowing in said return pipe; and

a controller for controlling said pump and said respective solenoid valves.

US 6,408,897 B1

SEALED CONFINEMENT DEVICE FOR CONNECTING A CONTAINER AND MEANS FOR DELIVERING A SUBSTANCE

Philippe Laurent, Oullins, and Jean-Pierre Grimard, Vif, both of France, assignors to Becton Dickinson France, S.A., Le Pont de Claix, France

PCT No. PCT/IB99/00083, § 371 Date Oct. 2, 2000, § 102(e) Date Oct. 2, 2000, PCT Pub. No. WO99/36029, PCT Pub. Date Jul. 22, 1999

PCT Filed Jan. 20, 1999, Appl. No. 582,020

Claims priority, application France, Jan. 20, 1998, 98 00866

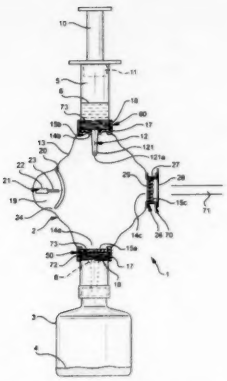
Int. Cl. B65B *3/04*

U.S. Cl. 141—100 **14 Claims**

1. Leaktight confinement appliance (**1**), intended to cooperate with a first independent receptacle (**5**) containing a substance (**6**), having a first transfer means (**12**) for transferring the substance into and out of the first receptacle, and a second independent receptacle (**3**) containing another substance (**4**), having a second transfer means (**8**) for transferring the other substance into and out of the second receptacle (**3**), and with at least one independent means (**71**) for delivery of a material, said appliance (**1**) comprising:

a handling chamber (**2**) defined by a wall (**13**) of flexible material substantially leaktight with respect to the external environment;

a means for leaktight assembly (**60**) between said handling chamber (**2**) and the first transfer means (**12**) of the first receptacle (**5**) with the first receptacle (**5**) remaining essentially outside said handling chamber, and this means occupying a passage (**14***b*) through said wall (**13**) of said handling chamber and being secured in a leaktight manner on said wall;



a means for leaktight assembly (**50**) between said handling chamber (**2**) and the second transfer means (**8**) of the second receptacle (**3**) with the second receptacle remaining essentially outside said handling chamber (**2**), and this means occupying another passage (**14***a*) through said wall of said handling chamber and being secured in a leaktight manner on said wall, whereby the first transfer means (**12**) selectively connects to the second transfer means (**8**) by at least partially collapsing said handling chamber for introducing the substance of the first receptacle (**5**) to the other substance of the second receptacle (**3**); and

a means (**70**) for leaktight connection between said handling chamber (**2**) and the delivery means (**71**) with the delivery means including a part outside said handling chamber, and this leaktight connection means occupying another passage (**14***c*) through said wall (**13**) of said handling chamber and being secured in a leaktight manner on said wall, whereby the material may be delivered from within said handling chamber through said delivery means (**71**).

US 6,408,898 B1

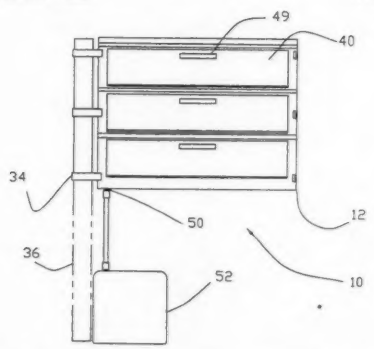
OIL RECOVERY DEVICE

Edward S. Huss, and Pamela J. Huss, both of 6500 Gurd Rd. P.O. Box A, Hastings, Mich. 49058

Filed Sep. 1, 2001, Appl. No. 944,025

Int. Cl. B65B *1/04*

U.S. Cl. 141—106 **9 Claims**



9. An oil recovery system for recovering residual oil from an oil container, said system comprising:

a housing having a bottom wall, a back wall, a top wall, a front wall, a first side wall, and a second side wall, said front wall

having a plurality of elongate openings therein extending between said first and second side walls, each of said openings having a generally rectangular shape such that each of said openings has a bottom edge, a plurality of slots extend through said front and back walls, said slots being aligned between said top and bottom walls and being positioned adjacent to said first side wall, said back wall having a plurality of apertures therein positioned nearer said top wall than said bottom wall;

a plurality of drawers each having a base wall, a facing wall, a rear wall, and a pair of lateral side walls, each of said drawers having a plurality of intermediate walls therein extending between said facing and rear walls such that a plurality of compartments are defined in each of said drawers, each of said drawers being positioned in one of said openings, each of said facing walls having a bottom edge hingedly coupled to and extending along one of the bottom edge of the associated opening such that each of said rear walls abutted against said back wall of said housing when said drawer is in a closed position, each of said facing walls having a height greater than a corresponding rear wall, each of said base walls having a pipe attached thereto, each of said pipes being positioned nearer said facing wall than said rear wall, said pipes being in communication with said compartments of the attached drawer, each of said compartments being sloped toward the pipe when said drawers are placed in said closed position, each of said pipes being angled downward from said second side wall toward said first side wall;

a tube being fluidly coupled to said housing and extending into said bottom wall;

a plurality of rain guards each comprising a panel attached to said front wall and extending over one of said openings in said housing; and

wherein each of a plurality of oil containers is positioned in one of the compartments such that oil within the oil containers is drained into said pipes, wherein the oil is removed from said housing through said tube.

US 6,408,899 B2

APPARATUS FOR ENCRUSTING A FILLING MATERIAL

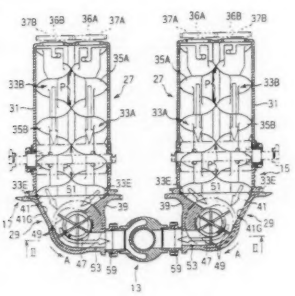
Torahiko Hayashi, and Yasunori Tashiro, both of Utsunomiya, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Tochigi-ken, Japan

Filed Jun. 12, 2001, Appl. No. 878,407

Claims priority, application Japan, Jun. 15, 2000, 2000-179867

Int. Cl. B67C *3/26;3/34*

U.S. Cl. 141—256 **6 Claims**



1. An apparatus for encrusting a filling material comprising a screw-transferring apparatus for filling materials to transfer a filling material supplied by a hopper for filling materials, a vane pump for filling materials to transfer a filling material that is fed by the screw-transferring apparatus to a combining nozzle, a screw-transferring apparatus for encrusting materials to transfer an encrusting material that is supplied by a hopper for crusts, and a vane pump for crusts to transfer a crust that is fed by the screw-transferring apparatus for crusts to said combining nozzle, the combining nozzle combining the encrusting material that is supplied by the vane pump for crusts with the filling material that is supplied by the vane pump for fling materials, which filling material is surrounded by the encrusting material, characterized in that each screw-transferring apparatus includes horizontal screws, in that each vane pump has a vertical rotating shaft, and in that the end of each screw is not held and is positioned at the inlet of either vane pump.

US 6,408,900 B1

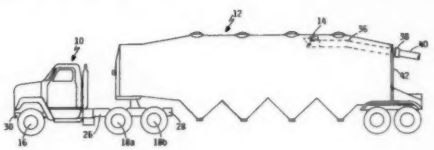
LOAD DISTRIBUTION DEFLECTOR

William F. Burian, Downers Grove; Charles Lonnie Horne, Chicago; James M. McLaughlin, Monee; Michael S. Ryan, Darien; Clayton Strand, Bolingbrook; Marvin Miller, Lockport, and Malinda Chilcote, Aurora, all of Ill., assignors to Salco Products, Inc., Lemont, Ill.

Filed Mar. 29, 2001, Appl. No. 821,594

Int. Cl. B65B *1/04*

U.S. Cl. 141—286 **40 Claims**



1. A deflector assembly adapted to be located within the interior of a trailer for distributing dry bulk during loading of the dry bulk into the interior of the trailer, said deflector assembly comprising a deflector having a deflecting surface capable of deflecting dry bulk loaded into the interior of the trailer and an air cylinder for moving said deflector from an opened position to a deflecting position, wherein the deflecting surface is not situated to deflect dry bulk when the deflector is in the opened position and the deflecting surface is situated to deflect dry bulk when the deflector is in the deflecting position.

US 6,408,901 B2

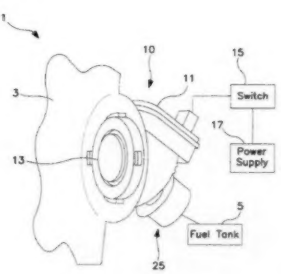
ACTUATOR WITH ANTI-PINCH FEATURE AND INTEGRATED POSITION CONTROL

John C. Holloway, Cumberland, R.I., and Thomas P. Schregardus, Somerville, Mass., assignors to Stoneridge Control Devices, Inc., Canton, Mass.

Provisional application No. 60/188,742, filed on Mar. 13, 2000. This application Mar. 13, 2001, Appl. No. 804,731.

Int. Cl. B65B *1/04*

U.S. Cl. 141—301 **38 Claims**



1. An electromechanical actuator, comprising:

an electric motor;

a conductive path normally connecting said motor for receiving a power supply input;

an output gear coupled to an output shaft of said motor;

an output shaft structure coupled to said output gear to allow relative motion between said output shaft structure and said output gear upon application of a predetermined level of force to said output shaft structure, said relative motion opening said conductive path; and a spring disposed between said output gear and said output shaft structure, said spring being configured to deflect for permitting said relative motion upon application of said predetermined level of force.

US 6,408,902 B1

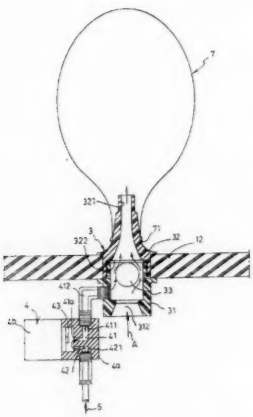
BALLOON-INFLATING DEVICE

Ting Chau Liau, PO Box 82-144, Taipei, Taiwan

Filed Jun. 15, 2001, Appl. No. 881,069

Int. Cl. B65B *1/04;3/04;* **B67C** *3/00*

U.S. Cl. 141—313 **4 Claims**



1. A balloon-inflating device capable of mixing a multiple type of gases, the device comprising:

(a) a body having an air-inlet cavity and a compression cavity;

(b) at least one air pump mounted to the body to pump air from the air-inlet cavity to the compression cavity;

(c) at least an air nozzle mounted to the body and having an air-inlet connected to the compression cavity, wherein the nozzle is provided with a stopper to seal the air-inlet in normal operating condition;

(d) at least a gas supply valve having an air-outlet connected to the air nozzle and having an air-inlet connected to a second gas supplier; and

(e) a control device for controlling the operation of the air pump and the gas supply valve;

wherein the body includes a hollow cylindrical body having a partition board positioned at the center thereof to divide the cylindrical body into the air-inlet cavity and the compression cavity, at least an air-inlet hole being provided at the circumferential edge of the air-inlet cavity corresponding to the hollow cylindrical body to lead the external air; and a top cover to sealingly fasten an opening at the top of the hollow cylindrical body;

whereby the opening and closing of the air pump and the gas supply valve inflate a balloon with either air or a gas, or a mixture of the compressed air of the air pump and the gas.

US 6,408,903 B1

FUEL TANK INTAKE ASSEMBLY

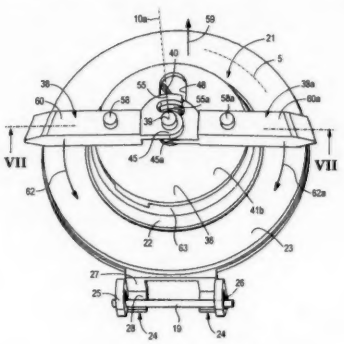
Thomas Theuer; Thomas Conrad, both of Treuchtlingen; Christian Sünkel, Michelau, and Kugler Clemens, Dittenheim, all of Germany, assignors to Alfmeier Prazision AG, Baugruppen und Systemlosungen, Treuchtlingen, Germany

Filed Nov. 3, 2000, Appl. No. 706,457

Claims priority, application Germany, Nov. 4, 1999, 199 54 110

Int. Cl. B65B *1/04;3/00;* **B67C** *3/00*

U.S. Cl. 141—348 **31 Claims**



1. A fuel intake assembly for a vehicle fuel tank, the assembly comprising:

a fitting defining a passageway in communication with the fuel tank and an opening spanning the passageway;

a closure flap pivotally mounted to the fitting so as to pivot between a closed position closing the opening and an open position opening the opening, the closure flap having a first side facing the passageway and a second side facing and in communication with an exterior of the vehicle;

a spring urging the closure flap toward the closed position;

a sealing element disposed on one of the closure flap or the fitting;

a seat disposed on the other of the closure flap or the fitting proximate the opening configured to sealingly engage the sealing element; and

a locking mechanism attached to the second side of the closure flap configured to releasably lock the closure flap in the closed position, the locking mechanism having a locking element movably disposed on the closure flap between a locked position and a released position.

US 6,408,904 B1

HYGIENIC BOTTLE CAP

Lawrence M. Dushman, Peach Tree City, Ga., assignor to Abel Unlimited, Inc., West Palm Beach, Fla.

Continuation-in-part of application No. 09/421,026, filed on Oct. 20, 1999, now abandoned, Provisional application No. 60/104,893, filed on Oct. 20, 1998. This application Apr. 13, 2001, Appl. No. 834,594.

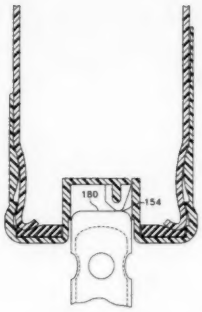
Int. Cl. B67D *5/00*

U.S. Cl. 141—352 **17 Claims**

1. A hygienic bottle cap for use with a fluid container having a neck, and a dispenser including a probe, the cap comprising;

a skirt and a crown portion constructed and arranged to receive the neck of the container therein such that an outer surface of the neck of the container is sealed by at least a portion of the inner surface of the crown portion;

a cylindrical wall having an upper portion and a lower portion and forming a central well in the crown portion, the central well defining an opening in communication with an interior of the bottle and being sealed by a base in a closed position;

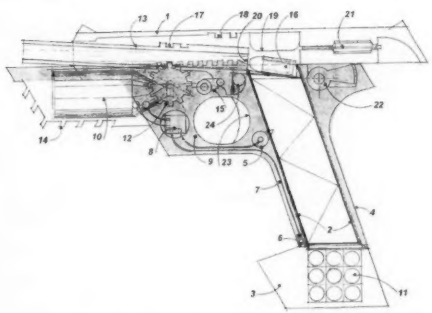


a pre-formed score line disposed partially around the perimeter of the base to define a flapper, a portion of the flapper remaining attached to the cylindrical wall upon insertion of the probe;

a protrusion supported on an underside of the flapper, adjacent the perimeter of the flapper, the protrusion including a base portion supported on the underside of the flapper, at least one first inclined surface and an engagement tip constructed and engaged to engage a blunt tip of the probe of the dispenser; and

wherein upon a probe engaging the protrusion, a portion of the flapper is separated from the cylindrical wall along the pre-formed score line in order to enter the container, a portion of the flapper remaining attached to the cylindrical wall so as to form a hinge, the hinge being disposed opposite the protrusion.

US 6,408,905 B1
ELECTRIC MOTOR-DRIVEN SEMI-AUTOMATIC HANDGUN REQUIRING MICRO-PROCESSOR CODE FOR OPERATION
Frederick A. Lee, 682 Broadway, New York, N.Y. 10012
Filed Dec. 8, 2000, Appl. No. 733,195
Int. Cl. F41A *17/00*
U.S. Cl. 142—70.01 **14 Claims**



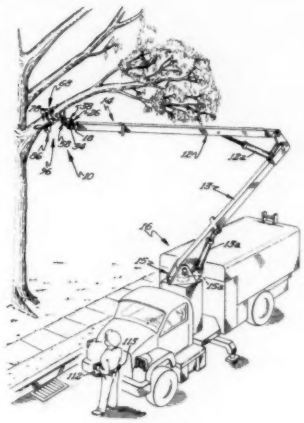
1. A safer system for a semi-automatic handgun that denies permission for its use except for the authorized owner/user, and visually conveys, by means of its physical condition, whether it could be fired, said system comprising:

A. a cartridge magazine-fed, slide operated, semi-automatic handgun with a forward loading and rearward ejection cycle;

B. a rechargeable battery connected to an electric motor disposed in the handgun that drives the slide forwards and backwards effective to load and eject a cartridge; and

C. a micro-processor switch with a pre-set code recognition feature that upon receiving the correct code entered by the authorized user of the handgun enables the motor to close the slide to load the handgun, and commands that when the cartridge magazine ejection button is pressed the motor engages to open the slide to eject any chambered cartridge.

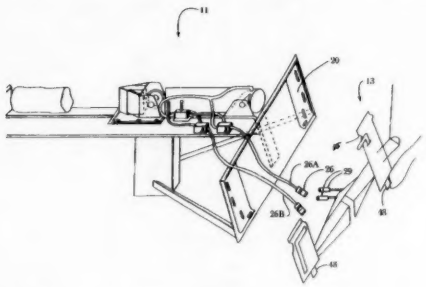
US 6,408,906 B1
GRIPPING AND CUTTING APPARATUS
Thomas A. Moon, Lena, and Gary D. Riha, Green Bay, both of Wis., assignors to Innotec Engineering, Inc., Lena, Wis.
Filed Apr. 14, 2000, Appl. No. 550,256
Int. Cl. A01G *23/095*
U.S. Cl. 144—24.13 **30 Claims**



24. Apparatus for gripping and cutting attachable to a free end of a tubular boom of a boom assembly mounted on a vehicle, comprising, in combination: a gripping and cutting assembly comprising, in combination: first and second shafts rotatable about first and second, spaced, parallel pivot axes, a first crank arm extending radially from the first shaft, a second crank arm extending radially from the second shaft, an extendable actuator having a first end pivotably mounted to the first crank arm about a third pivot axis and having a second end pivotably mounted to the second crank arm about a fourth pivot axis spaced from and parallel to the first, second, and third pivot axes, at least a first gripping arm extending radially from the first shaft, at least a second gripping arm extending radially from the second shaft, an abutment located equidistant between but in a plane parallel to but spaced from a plane extending between the first and second pivot axes to limit travel of the crank arms and rotational movement of the first and second shafts, and a saw system of the chain saw type including a bar pivotable abut an axis parallel to the first and second axes; means for mounting the gripping and cutting assembly to the free end of the tubular boom of the boom assembly for pivotable movement about a fifth axis, a sixth axis substantially perpendicular to the fifth axis, and a seventh axis substantially perpendicular to the fifth and sixth axes, with the mounting, means including a tubular insert having first and second ends and an outer surface having annular cross sections of a size corresponding to and for a slideable fit within the free end of the tubular boom, first pivot ears formed on the first end of the tubular insert, first actuator ears secured in the tubular insert spaced from the first end, a mount having second pivot ears pivotably mounted to the first pivot ears about the fifth pivot axis, with the mount having second actuator ears, and an extendable actuator having a first end pivotably mounted to the first actuator ears about an eighth pivot axis spaced from and parallel to the fifth pivot axis and having a second end pivotably mounted to the second actuator ears about a ninth pivot axis spaced from and parallel to the fifth and eighth pivot axes; means carried by the vehicle for controlling the operation of the boom assembly, the pivotable movement of the gripping and cutting assembly, the pivoting of the gripping arms, and the operation of the saw system;

and a remotely operated control operating the controlling means and which is untethered to the vehicle during operation, with the remotely operated control including a first transmitter, and the controlling means including a first receiver for receiving control transmissions from the first transmitter; wherein the saw system includes a sensor for detecting an operational mode of the saw system, with the controlling means further including an interlock for preventing operation of the boom assembly when the operational mode of the saw system is detected by the sensor.

US 6,408,907 B1
WOOD SPLITTING ATTACHMENT
Gerald Adrian Lantz, 2616 Peters Corner Rd., Marydel, Md. 21649
Filed Jul. 10, 2001, Appl. No. 902,368
Int. Cl. B27L *7/00*
U.S. Cl. 144—195.1 **18 Claims**

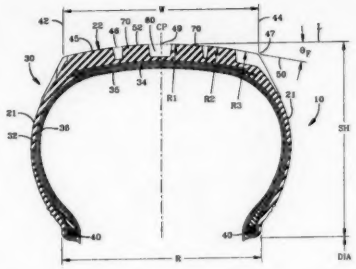


10. A wood splitter comprising:
a skid steer loader having a hydraulic power source:
wood supporting means:
means for splitting wood associated with said wood supporting means:
hydraulic means connected to said skid loader hydraulic power source:
connecting means for attaching said wood supporting means, said splitting wedge means and said hydraulic means to said skid steer loader.

US 6,408,908 B1
FRONT TIRES AND REAR TIRES FOR AUTOMOBILE OR LIGHT TRUCK
Anthony John Scarpitti, Uniontown; Michael Alois Kolowski, Mogadore; Frederick William Miller, Akron; Donald Woodrow Gilliam, Uniontown, and Keith Carl Trares, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
PCT No. PCT/US97/16906, § 371 Date Jan. 24, 2000, § 102(e) Date Jan. 24, 2000, PCT Pub. No. WO99/14064, PCT Pub. Date Mar. 25, 1999
PCT Filed Sep. 17, 1997, Appl. No. 463,842
Int. Cl. B60C *3/00;11/00;119/00*
U.S. Cl. 152—209.14 **5 Claims**

1. A pneumatic radial tire combination for four-wheeled automobile or light truck vehicles having a pair of front steer position tires and a pair of rear position tires, each tire having an axis of rotation and a casing, the casing having a carcass and a belt reinforcing structure radially outward of the carcass, a tread being radially outward of the belt structure, the tread having a pair of lateral edges, a tread arc extending between the lateral edges and a centerplane CP passing midway between the lateral edges and perpendicular to the axis of rotation, the tire combination has

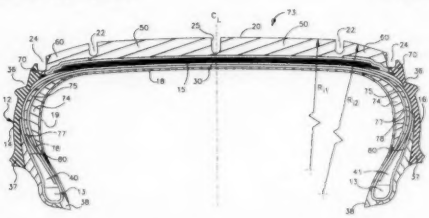
a first tread arc for the front position tires and a second tread arc for the rear position tires, the tread arcs defined by a radially



outer surface of the treads when the tires are normally inflated but unloaded, the first tread arc having on at least one-half of the tread at least three radii of curvature R_1, R_2, R_3 decreasing in size as the curvature extends from the centerplane CP to the lateral edge, the radius R_1 being a maximum radius at the centerplane of the tire and R_2 and R_3 being closer to the lateral edge than R_1, characterized by at an intersection of the lateral edge and the tread arc a straight line drawn between the intersection of the tread arc curvature and the centerline CP is inclined at an angle θ_F relative to tangent line L, L being tangent to the tread arc at the centerline CP and parallel to the rotation, R_1 being about 600 mm and greater than twice R_3, R_3 being greater than 200 mm and the lateral width of the tread of each front tire defined by a radius R_1, radius R_2 and radius R_3 being less than 60% of said arc width, greater than 20% of said arc width and greater than 20% of said arc width, respectively;

the second arc tread has a curvature of maximum radius R_1 at the centerplane CP of the tire and has an angle θ_R of less thanθ_F, θ_R being less than 5° relative to a tangent line L, L being tangent to the second tread arc curvature at the centerplane CP and parallel to the axis of rotation.

US 6,408,909 B1
RADIAL RUNFLAT PASSENGER TIRE WITH IMPROVED TREAD CONTOUR WITH DECOUPLING GROOVES
Gia Van Nguyen, Rossignol, Belgium, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
PCT No. PCT/US98/00717, § 371 Date May 11, 2000, § 102(e) Date May 11, 2000, PCT Pub. No. WO99/36278, PCT Pub. Date Jul. 22, 1999
PCT Filed Jan. 15, 1998, Appl. No. 554,469
Int. Cl. B60C *9/00;11/11;17/00;101/02;115/00*
U.S. Cl. 152—209.14 **5 Claims**



1. A pneumatic radial ply runflat passenger tire having a tread, two sidewalls, one or more plies extending from and wrapped about two annular bends and a belt structure located radially between the tread and the plies,

the tread having a center rib and a pair of side ribs separated from the center rib by a circumferential decoupling groove and a circumferential second decoupling groove;

the center rib having a first axial contour having a first radius, and the pair of side ribs each having a second axial contour sharing the same second radius;

the tire characterized by;

the first radius being larger than the second radius;

the first axial contour intersecting the second axial contours nontangentially at first and second meeting points, each of which meeting points forms a circle around the tread that is on a plane that is parallel with a equatorial plane of the tire;

the first and second decoupling grooves each having a pair of sides that are either zig-zag or sinusoidal and are suitably disposed and spaced from each other such that the circle of the first meeting point is axially between the pair of sides of the first decoupling groove, and the circle of the second meeting point is axially between the pair of sides of the second decoupling groove; and

the sidewalls having at least a first ply reinforced with cords having a modulus of at least 10 GPa and a second ply reinforced with cords having a modulus greater than the modulus of the cords of the first ply, and an insert disposed in the sidewalls between the first and second plies.

US 6,408,910 B1

TREAD INCLUDING RECESSED CHANNEL AND RECESSED INCISION AND MOLD FOR TREAD

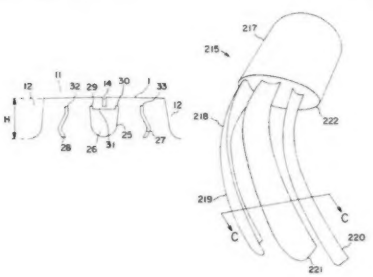
Alain Lagnier, Romagnat; Jean-Luc Chanet, Le Cendre, and Georges La Vialle, Billom, all of France, assignors to Compagnie Generale des Establishments Michelin-Michelin Cie, Clermont-Ferrand, France

Continuation of application No. PCT/EP98/02960, filed on May 20, 1998. This application Nov. 29, 1999, Appl. No. 450,255.

Claims priority, application France, May 30, 1997, 97 06766

Int. Cl. B29C *33/42;33/44;* **B60C** *11/11;11/117*

U.S. Cl. 152—209.17 **13 Claims**



1. A tread of thickness E for a tire, said tread having a running surface, limited transversely by lateral edges, said tread being provided when new with a tread pattern comprising at least a plurality of rubber blocks arranged circumferentially on at least one of its lateral edges, said rubber blocks being separated from each other by grooves oriented virtually transversely and separated from tread pattern motifs located axially to the inside by grooves oriented mainly circumferentially, wherein each of said plurality of blocks comprises:

several successive layers defined radially beneath the running surface when new corresponding to levels of partial wear of the tread, each of said levels being defined by its distance measured relative to the ring surface when new, a first level being located at a distance of between 15% and 45% of the thickness E of said tread and the following levels being located at distances greater than said first level, and for each level of wear:

at least one recessed channel of average width at least equal to the width of the transverse grooves, each recessed channel (1) having an average trace identical to the average trace of said transverse grooves, (2) forming a new groove opening radially towards the outside of the tread after wear of the new tread to the respective level, and (3) extending within the remaining thickness of the tread; and

at least one recessed incision, not opening to the running surface of the tread when new and having, in radial projection on the running surface of the tread when new, a transverse orientation identical or virtually identical to that of the recessed channel(s) projected on the same surface and each incision having small width compared with the average width of said channel(s), each incision opening rally onto the running surface at the time of the opening of the recessed channel to form said new groove on said running surface and extending within the thickness of the tread over the entire depth of the opened channel(s).

7. A mold for molding a tire provided with a tread extending axially via sidewalls as far as bead zones, said mold having a closed position and an open position and comprising two shells provided with molding surfaces each for molding a tire sidewall and a structure forming a ring concentric to the two shells for molding the tread of the tire, said ring and the shells, in the closed position of the mold, being in contact via their lateral ends, said mold being characterized in that:

at least one shell is formed of at least two annular shell parts concentric to each other, such that the molding surfaces of said parts, in the closed position of the mold, mold an entire sidewall,

at least one of the shell parts is provided with at least a plurality of elements in relief projecting onto the molding surface of said shell part, said elements in relief of the same shell part having a point of anchoring and an end axially outermost of anchoring and having virtually the same geometry and the same orientation defined as being the direction between the point of anchoring of an element on the shell part and the end of said axially outermost element of said shell part,

each of the shell parts bearing elements in relief is mobile in the circumferential direction relative to the other parts of the same shell, so as to permit the rotation of each of said parts relative to the other parts of the same shell at least under the action of the forces exerted by the tread on the elements in relief during demolding with the aim of facilitating demolding of the tire.

US 6,408,911 B1

STUDLESS PNEUMATIC TIRE INCLUDING BLOCK-SHAPED ISLAND PORTIONS EACH HAVING SIPES

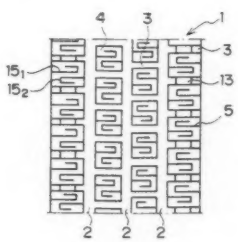
Chishiro Tanabe, and Yuji Yamaguchi, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 28, 1996, Appl. No. 654,976

Claims priority, application Japan, Jun. 8, 1995, 7-142204; Jun. 8, 1995, 7-142205; Sep. 28, 1995, 7-250998; Nov. 15, 1995, 7-297101

Int. Cl. B60C *11/11;11/12;107/00*

U.S. Cl. 152—209.5 **5 Claims**



1. A studless pneumatic tire in which a plurality of block-shaped island portions each having sipes are provided on a cylindrical tread extending between a pair of annular sidewalls, wherein:

said tread has at least two rubber layers having different hardnesses, and

the tread has at least one area having soft rubber and hard rubber and including sipes, the tread has at least one other area having soft rubber and hard rubber and including sipes, the

density of the sipes in the at least one area is larger than the density of the sipes in the at least one other area, the density of the sipes being defined as a total projected length of portions of the sipes within an area, the ratio of the volume of hard rubber to the volume of soft rubber in the at least one area is larger than the ratio of the volume of hard rubber to the volume of soft rubber in the at least one other area, and

further wherein each island portion comprises:

a first sipe which has an extension segment extending from a first lateral end of said island portion and traversing a first edge region and a central region of said island portion in a substantially axial direction, and a return segment, one end of said return segment being turned back at a second interface between the central region and a second edge region adjacent to a second lateral end or in the vicinity thereof and the other end of said return segment being terminated within the central region; and

a second sipe which has an extension segment extending from a second lateral end of said island portion and traversing the second edge region and a central region of said island portion in the substantially axial direction, and a return segment, one end of said return segment being turned back as a first interface between the central region and the first edge region adjacent to the first lateral end or in the vicinity thereof and the other end of said return segment being terminated within the central region.

US 6,408,912 B1

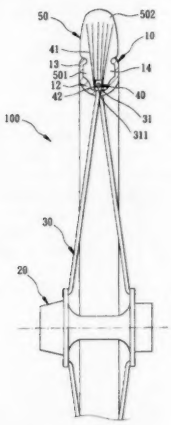
BICYCLE WHEEL ASSEMBLY

Cheng-Yu Li, No. 323, Chung-Hua Rd., Nantou City, Taiwan

Filed Jul. 13, 2001, Appl. No. 905,314

Int. Cl. B60C *25/00;7/00;5/16;7/24*

U.S. Cl. 152—393 **3 Claims**



1. A bicycle wheel assembly comprising:

an annular metal rim including an annular spoke-mounting wall, and left and right annular tire-clamping walls extending radially and outwardly from two opposite sides of said spoke-mounting wall to define a tire-retention groove thereamong;

a hub disposed coaxially within said spoke-mounting wall of said metal rim;

a plurality of spokes interconnecting said hub and said spoke-mounting wall of said metal rim;

a non-inflatable foam tire disposed in said tire-retention groove of said metal rim, and having an annular inner section clamped fixedly by said tire-clamping walls, and an annular outer section projecting outwardly and radially from said tire-retention groove; and

a tire reinforcing unit embedded within said foam tire, and including an annular non-stretchable strap embedded in said inner section of said foam tire and disposed around said spoke-mounting wall, and a plurality of angularly spaced apart rigid strings extending radially from said non-stretchable strap into said outer section of said foam tire.

US 6,408,913 B1

DEVICE FOR INFLATING AND DEFLATING A TIRE INNER TUBE, INNER TUBE AND WHEEL FORMED BY A TIRE AND A RIM INSIDE WHICH THE INNER TUBE IS ARRANGED

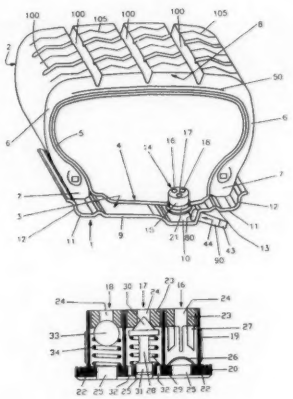
Renato Caretta, Gallarate; Alessandro Volpi, Milan, and Marco Cantu', Carnate, all of Italy, assignors to Pirelli Pneumatici S.p.A., Milan, Italy

Provisional application No. 60/086,888, filed on May 27, 1998. This application Feb. 18, 1999, Appl. No. 252,061.

Claims priority, application European Pat. Off., Feb. 19, 1998, 98830079

Int. Cl. F16K *15/20;* **B60C** *29/00*

U.S. Cl. 152—415 **19 Claims**



1. A device for inflating and deflating a flexible container which is elastically expandable for introduction of pressurized fluid into an internal volume of the container,

the device being inserted into a wall of the container,

wherein the device together with the container are housed inside a cavity that is isolable from a surrounding environment, and

wherein the device has no elements that connect the internal volume of the container with the surrounding environment,

further comprising at least one inlet valve for inflating the container with pressurized fluid,

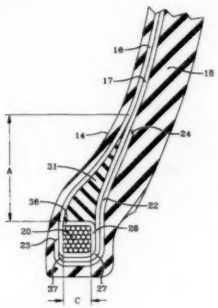
wherein the at least one inlet valve is a valve of a non-return type comprising an activation mechanism actuated by a difference in pressure existing between ends of the at least one inlet valve, and

wherein the activation mechanism comprises an obturator element which is displaceable from an open position to a closed position of the at least one inlet valve as a result of a difference in pressure existing between an inside and an outside of the container.

US 6,408,914 B1
PNEUMATIC TIRE WITH LOCKED BEAD CONSTRUCTION

André Lamock, Fauvillers, Belgium, and Carlo Bernard, Beringen, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

PCT No. PCT/US98/06034, § 371 Date Aug. 9, 2000, § 102(e) Date Aug. 9, 2000, PCT Pub. No. WO99/48708, PCT Pub. Date Sep. 30, 1999
PCT Filed Mar. 26, 1998, Appl. No. 601,931
Int. Cl. B60C *15/00;15/06*
U.S. Cl. 152—543 **13 Claims**



1. A pneumatic tire having:

(a) a pair of axially spaced apart bead portions with annular bead cores, each bead core having a radial cross-sectional shape which is substantially round or polygonal;

(b) a pair of rubber apex strips of a generally triangular cross-section neighboring the bead cores the apex strips having a radial height A and extending radially outwardly from the bead cores into the sidewalls of the tire; and

(c) at least three sets, a first radially inner, a second intermediate and a third radially outer set of carcass reinforcing structures, having each a main portion extending between the beads and their edges anchored in the beads, the tire characterized by;

the first carcass reinforcing structure being folded radially outwardly around each said bead core. so that the two edges of the second carcass reinforcing structure are located between the apexes and their neighboring bead cores;

the second carcass reinforcing structure having turndown portions folded radially inwardly around the second carcass reinforcing structure and the bead cores, so that the edges of the plies of the third carcass reinforcing structure are located near the axially inner side of the bead cores;

the third carcass reinforcing structure having turnup portions folded radially outwardly around each bead core, the second carcass reinforcing structure and the third carcass reinforcing structure so that the edges of the plies of the first carcass reinforcing structure are located between the radially outer portion of the bead core and the maximum section height of the tire.

13. A pneumatic tire having:

(a) a pair of axially spaced apart bead portions with annular bead cores, each bead core having a radial crop sectional shape which is substantially round or polygonal;

(b) a pair of rubber apex strips of a generally triangular cross section neighboring the bead cores the apex strips having a radial height A and extending radially outwardly from the bead cores into the sidewalls of the tire;

(c) a bead wrap ply structure;

(d) at least two sets, a first radially inner and a second radially outer set of carcass reinforcing structures, having each a main portion extending between the beads and their edges anchored in the beads, the tire characterized by:

the first carcass reinforcing structure being folded radially outwardly around each said bead core, so that the two edges of the first carcass reinforcing structure are located between the apexes and their neighboring bead cores;

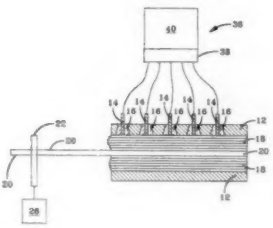
the second carcass reinforcing structure having turndown portions folded radially inwardly around the first carcass reinforcing structure and the bead cores, so that the edges of the plies of the second carcass reinforcing structure are located near the axially inner side of the bead cores;

the bead wrap ply structure having turnup portions folded radially outwardly around each bead core, the first carcass reinforcing structure and the second carcass reinforcing structure so that the edges of the plies of the bead wrap ply structure are located between the radially outer portion of the bead core and the maximum section height of the tire, the bead wrap ply structure extending axially inward and radially outward from the radially inner portion of the bead core to a radial distance at least one half the radial height of the bead core.

US 6,408,915 B1
APPARATUS FOR MONITORING THE CURE PROFILE ALONG A PULTRUSION DIE

William O. Ballata, Hayside, Kans.; David Spagnuolo, Newark, Del., and J. Robert Klinger, Easthampton, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 18, 2000, Appl. No. 506,933
Int. Cl. B29C *70/52*
U.S. Cl. 156—351 **28 Claims**



1. An apparatus, comprising:

a pultrusion die;

a first electrode mounted in the pultrusion die;

an insulator surrounding the first electrode in the pultrusion die;

a resin-impregnated preform that includes a second electrode therein, the resin-impregnated preform being inserted into the pultrusion die;

a constant contact electrode that contacts the second electrode; and

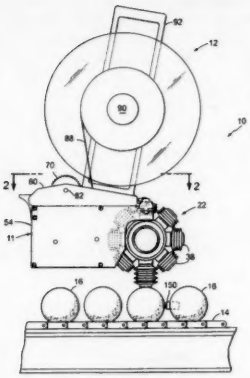
a power supply connected to the constant contact electrode wherein electric current flows from the power supply to the constant contact electrode then to the second electrode then through the resin-impregnated preform to the first electrode.

US 6,408,916 B1
LABELER HAVING INTERMITTENT DRIVE MECHANISM

David N. Anderson, Auburndale, and Wayne C. Sherman, Lakeland, both of Fla., assignors to FMC Technologies, Inc., Chicago, Ill.

Continuation of application No. 09/141,528, filed on Aug. 27, 1998, now Pat. No. 6,047,755, which is a continuation of application No. 08/863,036, filed on May 23, 1997, now Pat. No. 5,829,351. This application Apr. 10, 2000, Appl. No. 546,128.
This patent is subject to a terminal disclaimer.
Int. Cl. B65C *9/18*
U.S. Cl. 156—351 **12 Claims**

1. A labeler for applying labels on a carrier to articles transported by a conveyor comprising:



a label feed mechanism for feeding labels;

a rotatable bellows wheel having individual bellows spaced around the periphery thereof;

a vacuum source and a pressure source that may be selectively connected to each individual bellows such that each of the individual bellows is subjected to pressure when adjacent a label application position and subjected to vacuum for picking up a label from the label feed mechanism and retaining a label on one of the individual bellows;

a sensor for detecting an article and providing an indication of such detection; and

an electronically-controlled drive mechanism contained within the labeler to drive said label feed mechanism and to rotate said bellows wheel to permit it to effect the depositing of a label retained on one of the individual bellows on an article positioned at the label application position upon receipt of an indication from said sensor,

wherein said electronically-controlled drive mechanism operates intermittently to advance the label feed mechanism and the bellows wheel in response to the detection of an article.

US 6,408,917 B1

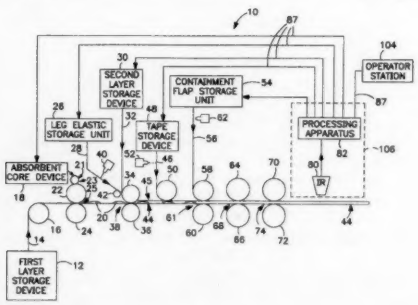
INFRARED IMAGING TO DETECT COMPONENTS ON PERSONAL CARE ARTICLES

Thomas Arthur Bett, Oshkosh; Jean Louise Krueger-Justinger, and Tanakon Ungpiyakul, both of Neenah, all of Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Division of application No. 09/190,692, filed on Nov. 12, 1998, now Pat. No. 6,224,699. This application Apr. 26, 2000, Appl. No. 558,926.

Int. Cl. B32B *31/16*

U.S. Cl. 156—378 **34 Claims**



1. Fabrication apparatus for fabricating composite personal care articles and sensing assembly quality characteristics of the personal care articles so fabricated, at least one of the components of precursors of the personal care articles so fabricated comprising a continuous web of material, said fabrication apparatus comprising:

(a) fabrication machinery arranged to transport the web along a fabrication line, past a plurality of work stations where work is performed on the web, for fabricating the personal care article precursors according to a predetermined arrangement, thereby to form an array of precursors of such personal care articles on the web;

(b) separation apparatus separating the web, and the array of personal care article precursors thereon, from the web, and into individual personal care articles, including severing the web across a transverse dimension thereof; and

(c) infrared sensing and signal processing apparatus disposed in cooperating relationship with the web, and sensing infrared signatures of product fabricated on the web, thereby determining assembly quality characteristics of respective ones of the composite personal care articles or composite personal care article precursors, and outputting a signal representative of the sensed characteristics.

US 6,408,918 B1

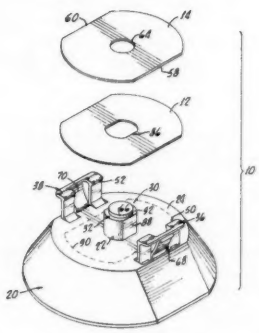
OPTICAL DISC ADHESIVE LABEL APPLICATOR FOR NON-CIRCULAR OPTICAL DISC

Michael Hummell, Newport Beach, and Joseph Sandor, Corona Del Mar, both of Calif., assignors to Avery Dennison Corporate Center, Pasadena, Calif.

Filed Oct. 23, 2000, Appl. No. 694,719

Int. Cl. B32B *31/00;* **B65C** *9/26*

U.S. Cl. 156—391 **49 Claims**



1. A device for applying a non-circular adhesive label to a non-circular optical disc, said device comprising:

a base having an axial opening therein and a platform, surrounding the opening, for supporting the non-circular label;

a plunger having a disc support element projecting from the platform through the base axial opening and moveable between a first position supporting the disc above the platform and a second position enabling contact between the label and the disc; and

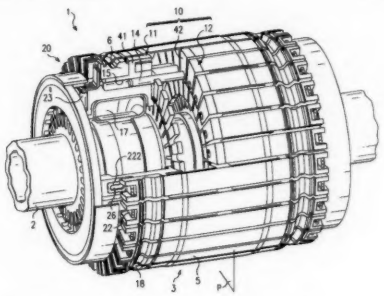
a first arm moveable with said plunger for contacting the disc and aligning the disc with the label on said platform as the plunger is moved from the first position to the second position.

US 6,408,919 B2

METHOD AND APPARATUS FOR MANUFACTURING TIRES

Dominique Cordaillat, Billom; Olivier Muhlhoff, Clermont-Ferrand, and Bruno Panighel, Aulnat, all of France, assignors to Compagnie Generale des Etablissements, Michelin-Michelin & Cie, Clermont-Ferand, Cedex 09, France

Provisional application No. 60/096,943, filed on Aug. 18, 1998.
This application Apr. 23, 1999, Appl. No. 299,229.
Claims priority, application France, Apr. 27, 1998, 98 05642
Int. Cl. B29D *30/32*
U.S. Cl. 156—402 **9 Claims**



1. An assembly drum for the manufacture of tires, said drum comprising a body with a cylindrical receiving surface for the products to be assembled, said receiving surface having a circumferential groove at each end for receiving a tire bead wire, the body being mounted on a center shaft, at least one lifting device mounted on the drum and situated at one end of the receiving surface axially outside the groove at the end of the receiving surface, said lifting device having a plurality of lifting fingers distributed circularly around the center shaft, said fingers extending radially and presenting a bearing surface for the products to be assembled, a radial guide for each of the fingers and guiding the finger for radial movement, and control means for said lifting device, said fingers being deployable radially toward the outside of the drum by radial movement under the action of said control means.

US 6,408,920 B1

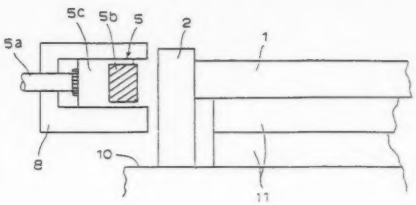
PRESS-BONDING JIG FOR PRESSING VERTICAL PLATE MATERIALS ON HORIZONTAL PLATE MATERIALS AND METHOD OF USING SAME TO BOND VERTICAL PLATE MATERIALS ON HORIZONTAL PLATE MATERIALS

Yakuzo Tanizaki, Tokyo; Seigi Suzuki, and Shigeyuki Nishiura, both of Toyohashi, all of Japan, assignors to Du Pont-MRC Co., Ltd., Tokyo, Japan

PCT No. PCT/JP98/03353, § 371 Date Mar. 6, 2000, § 102(e) Date Mar. 6, 2000, PCT Pub. No. WO99/11435, PCT Pub. Date Mar. 11, 1999
PCT Filed Jul. 28, 1998, Appl. No. 508,015
Claims priority, application Japan, Sep. 3, 1997, 9-238638
Int. Cl. B30B *15/00*
U.S. Cl. 156—581 **10 Claims**

1. A press-bonding jig for press-bonding a vertical plate material to a horizontal plate material, set at a workbench having a positioning means for positioning a long horizontal plate material and a long vertical plate material or at a member disposed around the workbench to press and fix the respective plate materials to each other along edge portions thereof, characterized by comprising:

at least one pressing member for press-bonding the respective plate materials along a length direction thereof; a plurality of actuation means disposed along a pressing and bonding surface of the plate materials for actuating the pressing member in a pressing direction; and a start/stop means for starting and stopping the actuation means,



wherein said horizontal plate material is a counter plate material and said vertical plate material is a front-edge plate material and a backsplash plate material,

said actuation means of said pressing member for pressing said front-edge plate material are horizontally arranged at intervals of not less than four means/m, and

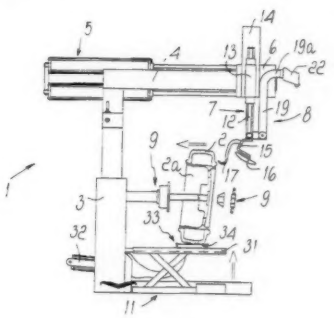
said actuation means of said pressing member for pressing said backsplash plate material are horizontally arranged at intervals of not less than three means/m and vertically arranged at not less than four means/m.

US 6,408,921 B1

MULTIPURPOSE STATION FOR MOUNTING AND REMOVING CONVENTIONAL AND SPECIAL TIRES

Maurizio Bonacini, Correggio, Italy, assignor to Guiliano S.R.L., Correggio, Italy

Filed May 12, 2000, Appl. No. 570,833
Claims priority, application Italy, May 14, 1999, MO99A0098
Int. Cl. B60C *25/135*
U.S. Cl. 157—1.24 **16 Claims**



1. A multipurpose station for mounting on and removing from vehicle wheels conventional and special tires, comprising:

a turret-type frame;

a horizontal guiding cross-member cantilevering out from a top vertex of said frame;

a carriage which is supported on said cross-member so as to be movable back and forth thereon;

first and second tire changing means adapted to operate at tire beads for mounting and removing the tires from respective wheel rims of vehicle wheels, wherein said first tire changing means comprise a substantially vertical rod, a corresponding sleeve which is rigidly coupled to said carriage and in which said vertical rod is slidingly fitted, and first and second tools correspondingly usable on conventional and special tires, respectively, said first and second tools being alternately applicable at a lower end of said rod;

an actuator for actuating said carriage;

conventional supporting elements for rotatably supporting and clamping the wheels arranged at said frame at a substantially median vertical elevation thereof;

pusher means located at a downward region of said frame to co-operate with said tire changing means for mounting and removing the tires from the wheel rims; and

lifting means, located at a downward region of said frame, for lifting the wheels vertically towards said conventional supporting elements, said lifting means comprising a cradle element which is movable horizontally with a sliding adjustable movement to apply pressure to the tire beads of mounted tires for seating thereof on sidewalls of the wheel rims.

US 6,408,922 B2

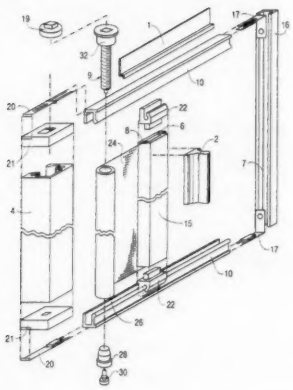
SELF-SUPPORTING CONSTRUCTION FRAME AND METHODS OF USE THEREOF FOR THE INSTALLATION OF DOORS AND WINDOWS

Don Desrochers, 1809 Buccaneer Ter., Sarasota, Fla. 34231

Filed May 5, 1999, Appl. No. 305,677

Int. Cl. A47H *1/00*

U.S. Cl. 160—24 **20 Claims**



1. A removable self-supporting construction frame, comprising:

two vertical portions; and

two horizontal portions;

wherein said two horizontal portions are detachably coupled to said two vertical portions by respective removable interlocking clips therebetween to form the removable self-supporting construction frame;

wherein one of said two vertical portions or one of said two horizontal portions is an anchor portion and opposing other ones of said two vertical portions and said two horizontal portions are guide rails;

wherein said anchor portion includes a housing; and

wherein said housing stores a retractable screen, a portion of said retractable screen being movable within said guide rails.

US 6,408,923 B1

VERTICAL BLIND

Ming Nien, No. 11, Kungchu Rd., Fangyuan Industrial Dist., Houliao Village, Fangyuan Hsiang, Changhua Hsien, Taiwan

Filed Feb. 21, 2001, Appl. No. 790,363

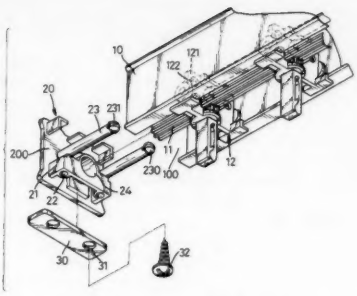
Int. Cl. E06B *9/36*

U.S. Cl. 160—168.1 V **1 Claim**

1. A vertical blind comprising:

a track adapted to be mounted on a ceiling, the track being an inverted U-shape with two sidewalls and a slot defined in a lower portion of the track;

multiple clamps partially slidably received in the track and clamping vertical slats, each clamp including a shoulder vertically formed relative to the sidewalls of the track and at least one through-hole defined in the shoulder parallel to the track;



two end pieces attached to two opposite ends of the track, each of the two end pieces including:

a faceplate abutting and closing the end of the track;

a block extending from the faceplate and received in the track;

at least one bore defined in the block and facing the slot in the track;

a recess defined in the block, the two recesses of the two end pieces facing each other; and

at least one rod extending perpendicularly from the faceplate and aligning with the through-hole in a corresponding one of the multiple clamps, the rod having an enlarged head formed on a free end of the rod and a groove diametrically defined in the enlarged head, the enlarged head having a diameter greater than that of the through-hole of each clamp, the rod holding the nearest clamp in place after the enlarged head passes through the through-hole of the nearest clamp;

a shaft rotatably received in the track for adjusting an angle of the slats, the shaft having two ends each received in the recess in a corresponding one of the two end pieces; and

a positioning plate secured on the block of the end piece and having at least one hole defined to correspond to at least one bore in the block, a screw extending through the hole and screwed into the bore of the end piece to secure the positioning plate on the end piece and clamping the track with the block to hold the end piece in place.

US 6,408,924 B1

CONTROL SYSTEM FOR A VERTICAL VANE COVERING FOR ARCHITECTURAL OPENINGS

Richard N. Anderson, Whitesville, and Eugene W. Thompson, Maceo, both of Ky., assignors to Hunter Douglas Inc., Upper Saddle River, N.J.

Continuation of application No. 09/592,510, filed on Jun. 12, 2000, which is a continuation of application No. 08/915,793, filed on Aug. 21, 1997, now Pat. No. 6,116,322, which is a continuation-in-part of application No. 08/724,576, filed on Sep. 30, 1996, now Pat. No. 6,135,188, Provisional application No. 60/047,075, filed on May 19, 1997. This application Nov. 28, 2001, Appl. No. 996,638.

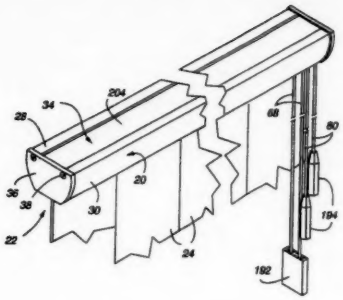
Int. Cl. E06B *9/36*

U.S. Cl. 160—168.1 V **5 Claims**

1. A control system for a covering for an architectural opening wherein the covering includes a plurality of vertically oriented covering segments adapted to be moved horizontally between an extended position wherein the segments are distributed across the architectural opening and a retracted position wherein the segments are horizontally stacked adjacent to at least one side of the architectural opening, said control system comprising in combination:

an elongated headrail adapted to extend across the architectural opening, said headrail having a length,

a plurality of carriers operatively supported by and movable along said length of said headrail, said carriers adapted to support the covering segments,



a pantograph system interconnecting said carriers, said pantograph system including two sets of links with the links of one set being parallel with each other and the links of the other set being parallel with each other but not with the links of said one set, said links in said one set having a plurality of laterally compressible pins protruding from one side and said other set of links having a plurality of holes at least some of which are adapted to rotatably receive one of said plurality of pins from said one set of links, said at least some of said holes having a tapered surface adapted to laterally compress said one of said pins being advanced thereinto in the process of releasably retaining said one of said pins in said opening, and

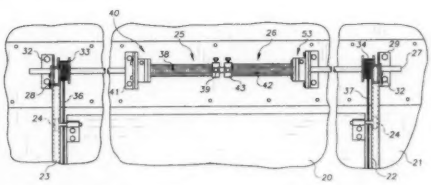
an operating mechanism connected to said carriers for moving said carriers along said length of said headrail,

wherein said carriers have a protrusion with a laterally directed tab on a distal end thereof and wherein at least one of said holes in said links of the other set has a keyway adapted to slidably received said tab thereby allowing said carrier to be releasably connected to said link of said other set.

US 6,408,925 B1
COUNTERBALANCING APPARATUS FOR ROLL-UP DOOR

Edward Dorma, Sarasota, Fla., assignor to Industrial Door Company, Inc., Coon Rapids, Minn.

Provisional application No. 60/094,728, filed on Jul. 30, 1998. This application Jul. 27, 1999, Appl. No. 361,770.
Int. Cl. E05F *15/00*
U.S. Cl. 160—191 **29 Claims**

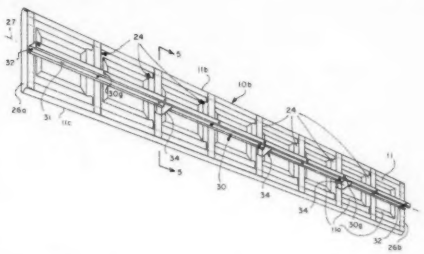


1. A method of counterbalancing a roll-up door comprising: providing a shaft operatively connected to the door for transmitting forces between the door and shaft, providing a coil spring having opposite ends, a longitudinal axis and adjacent coils engaging each other, positioning the coil spring around the shaft, anchoring one end of the spring to the shaft, mounting the other end of the spring on a block having a threaded bore, mounting the block on a threaded sleeve located around the shaft, rotating the sleeve relative to the block to move the other end of the spring in a longitudinal direction to elongate the spring to space adjacent coils of the spring from each other to compensate for spring growth during winding of the spring, rotating the elongated spring to wind the spring to apply torsion force to the shaft thereby counterbalancing the roll-up door, and holding the spring in the wound position to continuously apply torsion force to the shaft.

US 6,408,926 B1
SECTIONAL DOOR REINFORCEMENT SYSTEM AND METHOD

Richard K. Hoofard, Dallas; Ted Lefkovits, Richardson, and Michele Rene Womack, Carrollton, all of Tex., assignors to Overhead Door Corporation, Dallas, Tex.

Filed Nov. 3, 2000, Appl. No. 705,972
Int. Cl. E05D *15/26*
U.S. Cl. 160—236 **16 Claims**



1. A reinforced sectional door panel comprising a panel front wall, a top edge, a bottom edge and at least two reinforcing stiles spaced apart on said panel and extending between said edges, respectively;

support brackets secured to said stiles, respectively, and adapted to locate and support a reinforcement beam thereon, respectively;

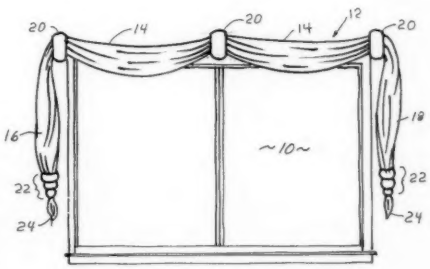
an elongated beam mounted on said brackets to reinforce said panel against deflection, said beam including a channel shaped cross section, a web, opposed flanges and respective distal flange portions extending toward each other and generally parallel to said web to form a substantially C-shaped cross section; and

said support brackets each include a support surface thereon and a beam locating portion for locating said beam with respect to said stiles when said beam is placed on said support brackets, respectively.

US 6,408,927 B2
DRAPERY RETAINER

Todd Kananen, 543 Hartsough, and Bill Kananen, 701 Pacific, both of Plymouth, Mich. 48170

Provisional application No. 60/082,274, filed on Apr. 18, 1998. This application Apr. 19, 1999, Appl. No. 294,763.
Int. Cl. A47H *19/00*
U.S. Cl. 160—349.2 **10 Claims**



1. A drapery retainer comprising a very large spherical bead having a sidewall and hollow interior, no more than two holes formed in the bead by truncating a portion of the bead sidewall and communicating with the hollow interior, said holes and bead hollow interior sized to accept a drape inserted through the holes and into the hollow interior, and

a decorative covering applied to the retainer and means to attach the covering to the retainer.

US 6,408,928 B1

PRODUCTION OF FOAMABLE METAL COMPACTS AND METAL FOAMS

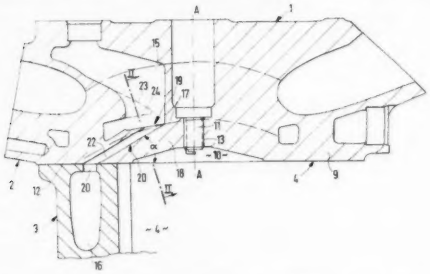
Peter Heinrich, Germering, and Heinrich Kreye, Hamburg, both of Germany, assignors to Linde Gas Aktiengesellschaft, Höllriegelskreuth, Germany

Filed Sep. 8, 2000, Appl. No. 658,264

Claims priority, application Germany, Sep. 8, 1999, 199 42 916

Int. Cl. B22D *23/00*

U.S. Cl. 164—46 **12 Claims**



1. A method for the production of foamable metal bodies, comprising:

forming a compact body from a powder mixture that comprises at least one metal powder and at least one blowing agent powder, which produces gas upon heating to a temperature equal to or above a breakdown temperature of the blowing agent,

wherein the forming of the compact body is performed by high-velocity flame spraying or by cold-gas spraying.

US 6,408,929 B2

METHOD AND APPARATUS FOR THE PRODUCTION OF PRECISION CASTINGS BY CENTRIFUGAL CASTING WITH CONTROLLED SOLIDIFICATION

Alok Choudhury, Püttlingen; Harald Scholz, Frankfurt am Main; Matthias Blum, Büdingen; Georg Jarczyk, Grosskrotzenburg; Marek Gorywoda, Hanau, and David Francis Lupton, Gelnhausen, all of Germany, assignors to Ald Vacuum Technologies AG, Erlensee, and W. C. Heraeus GmbH & Co. KG, Hanau, both of Germany

Division of application No. 08/937,995, filed on Sep. 26, 1997, now Pat. No. 6,250,366. This application May 4, 2001, Appl. No. 849,045.

Claims priority, application Germany, Sep. 26, 1996, 196 39 514

Int. Cl. B22D *13/06*

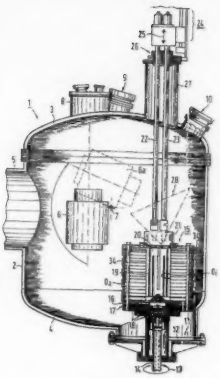
U.S. Cl. 164—338.1 **15 Claims**

1. An apparatus for precision casting of directional solidified castings, said apparatus comprising:

a melting and casting device having a closed chamber for creating a protective atmosphere of either vacuum or protective gases;

a rotatable mold supported in said chamber, said mold having a central gate and a plurality of mold cavities extending from the gate towards an outer circumference (D_a) of the mold, said mold having a rotary drive for creating centrifugal casting;

a heating device for preheating said mold, said heating device being relatively movable between a position within said gate and outside said gate and creating a temperature gradient falling from the gate towards said outer circumferences of the mold;



the mold being formed of a material or a material combination with a coefficient of thermal conductivity lower than that of copper;

a motion device for generating said relative motion of said heating device.

US 6,408,930 B1

ADJUSTABLE PLATE MOLD

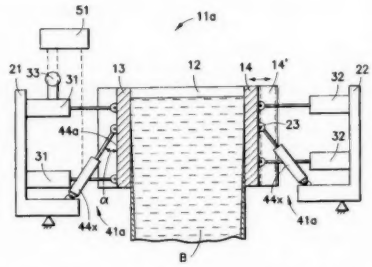
Horst von Wyl, Duisburg; Hans Siemer, Essen, and Axel Scholz, Duisburg, all of Germany, assignors to Mannesmann AG, Düsseldorf, Germany

Filed Sep. 8, 1999, Appl. No. 392,051

Claims priority, application Germany, Sep. 8, 1998, 198 42 110

Int. Cl. B22D *11/04;11/10*

U.S. Cl. 164—436 **9 Claims**



1. An adjustable plate mold for forming a slab having a cross-section of predetermined length and width, comprising:

sidewalls defining a length and a width of the slab to be formed including a pair of opposing broad-side walls and first and second narrow-side walls clampable between said broad-side walls; and

a framework including first and second cassette holders respectively corresponding to said first and second narrow-side walls, first and second actuating devices respectively inserted in said first and second cassette holders and connected to said first and second narrow-side walls, said first and second actuating devices operatively arranged for respectively moving said first and second narrow-side walls along a horizontal line for adjusting a size of the slab to be output, and first and second holding parts respectively connected between said first and second cassette holders and said first and second narrow-side walls for holding said first and second narrow-side walls at a constant horizontal level along the horizontal line,

wherein said first holding part comprises a first rod having an adjustable length and articulately connected between said

first narrow-side wall and said first cassette holder, said first rod being guided at an acute angle to said first narrow side wall and non-parallel with said horizontal line, and said second holding part comprises a second rod having an adjustable length and articulately arranged between said second cassette holder and said second narrow-side wall, said second rod being guided at an acute angle to said second narrow-side wall and non-parallel with said horizontal line.

US 6,408,931 B1

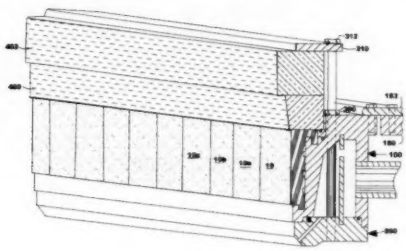
METHOD FOR MAKING CASTING ANNULUS USING INDEPENDENTLY POSITIONED GRAPHITE INSERTS

Ravindra V. Tilak, 5261 Nantucket La., Anaheim Hills, Calif. 92807

Division of application No. 09/301,655, filed on Apr. 28, 1999, now Pat. No. 6,192,970. This application Nov. 14, 2000, Appl. No. 711,384.

Int. Cl. B22D *11/049*

U.S. Cl. 164—459 **20 Claims**



1. A method of manufacturing a molten metal casting annulus that comprises an insert support and cooling frame which cross-section defines a plane, said frame further defining an annular face that is generally perpendicular to said plane, said plane and annular face defining an enclosed planar annular space such that said annular face faces said enclosed planar annular space, said frame further defining an annular groove adjacent said annular face, and a multiplicity of graphite casting annulus insert components supported on said insert support and cooling frame, said insert components being fitted edge to edge around said casting annulus to define said annulus, said insert components further comprising a lip snugly fitted in said annular groove for positioning and locking said insert components in said frame, said method comprising chilling the graphite casting annulus insert components before inserting the lip of the respective insert components into the annular groove in said frame and allowing said insert components to warm and thermally expand to lock the lip in position in said groove.

US 6,408,932 B1

HEAT EXCHANGER HAVING HIGH MOISTURE TRANSFER CAPABILITY IN HIGH RELATIVE HUMIDITY AIR

Donald F. Steele, Cohasset, Mass., and Lawrence C. Hoagland, Center Harbor, N.H., assignors to Airxchange, Inc., Rockland, Mass.

Filed Mar. 10, 2000, Appl. No. 523,352

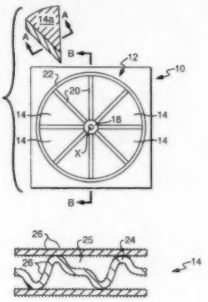
Int. Cl. F23L *15/02*

U.S. Cl. 165—8 **13 Claims**

1. A regenerator energy exchange device, comprising:

a frame which is rotatable about a rotation axis; and

an energy exchange matrix supported by the frame and disposed to allow intake and exhaust air to pass therethrough, the matrix comprising a plurality of interchangeable segments,



each of said segments containing at least one desiccant selected from the family of desiccants having Brunauer classification numbers between 1 and 5, wherein the matrix contains desiccants of at least two different Brunauer classifications.

US 6,408,933 B2

HEAT EXCHANGER HAVING ATTACHMENT STRUCTURE OF ELASTIC SUPPORT MEMBER

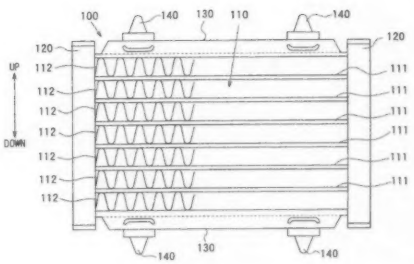
Shokichi Fukuoka, Nishio; Yoshiharu Kajikawa, Hekinan; Akio Hirano, Toyoake; Yasuaki Tsukagoshi, Nishio; Atsushi Yazawa; Yasuhiro Ando, both of Okazaki; Fumiaki Nakamura, Kariya; Hideo Harada, Okazaki, and Shinichi Inagaki, Kasugai, all of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Jun. 7, 2001, Appl. No. 876,660

Claims priority, application Japan, Jun. 8, 2000, 2000-172110; Aug. 25, 2000, 2000-256531; Jan. 11, 2001, 2001-004025

Int. Cl. F28F *9/00*

U.S. Cl. 165—67 **13 Claims**



1. A heat exchanger comprising:

a core portion in which a first fluid flows, the heater core being disposed to perform a heat exchange between the first fluid and a second fluid passing through the core portion;

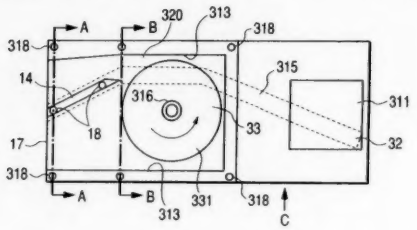
a side plate disposed at an end of the core portion, for reinforcing the core portion, the side plate having a pair of opposite walls disposed opposite to each other; and

a support member for supporting the core portion, the support member being made of an elastic material and being inserted between the opposite walls of the side plate to have an inserted portion inserted into the side plate, wherein:

the inserted portion of the support member has a recess portion recessed to an inner side; and

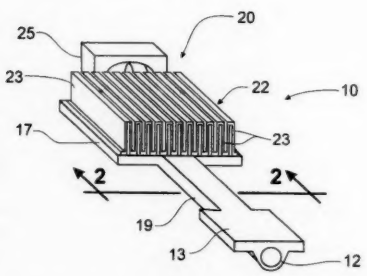
the opposite walls have a protrusion portion protruding to an inner side between the opposite walls, the protrusion portion being provided to be engaged with the recess portion of the support member.

US 6,408,934 B1
COOLING MODULE
Yoshio Ishida; Akimi Shutou, and Takao Terasaka, all of Osaka, Japan, assignors to Diamond Electric Mfg. Co., Ltd., Osaka, Japan
Filed May 26, 1999, Appl. No. 318,792
Claims priority, application Japan, May 28, 1998, 10-166297; Sep. 21, 1998, 10-285906; Oct. 14, 1998, 10-291701
Int. Cl. F28F *7/00;* **F28D** *15/00;* **H01L** *23/34;* **H05K** *7/20*
U.S. Cl. 165—80.3 **1 Claim**



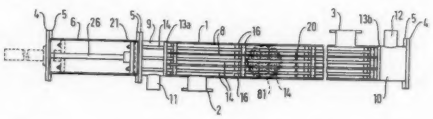
1. A cooling module comprising:
a collector for receiving heat from a heat generating object, a fan motor capable of causing a directional air flow, and blades and a fin structure which are disposed on a plate,
an air guide disposed surrounding at least said fan motor and said blades on said plate, and
a cover applied to said air guide so as to form a duct,
a heat pipe and a groove for receiving said heat pipe provided on and in the lower surface of said plate, while making a detour around a position used for mounting said motor fan, said heat pipe and said groove ranging from said collector to said duct, and
a cover made of good heat conduction applied to the upper side of said fin structure.

US 6,408,935 B1
HEAT SINK ASSEMBLY WITH OVER-MOLDED COOLING FINS
Robert E. DeHoff, Mt. Joy; Jason Allen Brehm, Seven Fields, both of Pa., and Kevin A. Grubb, Groton, Conn., assignors to Thermal Corp., Stanton, Del.
Filed Aug. 16, 2000, Appl. No. 639,165
Int. Cl. H05K *7/20*
U.S. Cl. 165—80.3 **10 Claims**



1. A heat sink assembly for use in transferring and dissipating heat generated by electronic components comprising:
a base member formed with a plastic material having a high conductivity factor and an ability to flow into an injection mold;
a fin array formed from a single sheet of material and folded into a convoluted shape that incorporates a series of parallel plates through which air can be drawn to dissipate the heat generated from the electronic components, said fin array being over-molded into a top portion of said base member so that said fin array is converted into an integral part of said base member;
a heat input portion positionable adjacent to said electronic components and formed on a bottom portion of said base member opposite of said fin array;
a heat pipe over-molded into said base member and operably associated with said heat input portion to transfer heat generated by said electronic component to said base member; and
a cooling fan mounted to move air across said fin array wherein said base member transfers heat from said heat pipe to said fin array and wherein said fin array is aligned so that air is moved between said parallel plates in a direction generally parallel to a line extending between said heat input portion and said base member.

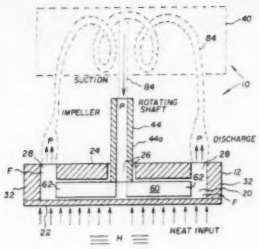
US 6,408,936 B2
TO HEAT EXCHANGERS
Jesus Pagan Duran, Murcia, Spain, assignor to HRS Spiratube S.L., Murcia, Spain
Continuation of application No. PCT/EP99/05077, filed on Jul. 16, 1999. This application Jan. 16, 2001, Appl. No. 761,449.
Claims priority, application Spain, Jul. 16, 1998, 9801521
Int. Cl. F28F *17/00*
U.S. Cl. 165—94 **23 Claims**



1. A heat exchanger assembly which comprises a casing housing at least one product conduit extending substantially therethrough and with a void surrounding the product conduit receiving in use, heat exchange service fluid, wherein the assembly further comprises a mount extending through the product conduit, said mount being moveable in a reciprocating manner along the product conduit and having a scraping means projecting therefrom towards an inner wall of the product conduit wherein the scraping means comprises a scraping head movably mounted outwardly on an arm characterised in that the scraping head is resiliently biased towards a wall of the product by a resilient biasing means associated with or comprising the arm such that upon reciprocation of the mount within the product conduit, the scraping means will scrape residues from the inner wall of the product conduit.

US 6,408,937 B1
ACTIVE COLD PLATE/HEAT SINK
Sanjay K. Roy, P.O. Box 248433, Coral Gables, Fla. 33124
Filed Nov. 15, 2000, Appl. No. 713,109
Int. Cl. F28D *15/00*
U.S. Cl. 165—104.33 **24 Claims**

1. A heat sink apparatus for gathering and dissipating heat from a heat source having a heat source housing, the apparatus comprising:
an impeller chamber having a chamber interior and containing a heat transfer fluid and comprising a heat transfer wall for transferring heat from said heat source into said chamber;
a heat transfer fluid within said chamber;
a fluid circulation path including said chamber interior which is configured to prevent the formation of stagnant fluid dead spaces;
and fluid propelling means for propelling said fluid through said circulation path and across said heat transfer wall such that said fluid absorbs heat at said heat transfer wall and flows to a heat discharge region remote from said heat transfer wall where the heat is dissipated into the surrounding environment;



wherein said fluid propelling means comprising a mechanical fluid driving structure for rapidly moving fluid across a wall adjacent to the heat source;

wherein the heat transfer wall comprises one of: a planar surface, and an axisymmetric surface;

wherein said fluid propelling means comprises a rotating impeller forcing the fluid in a radial fashion over said heat transfer wall;

wherein said heat discharge region comprises a heat dissipating enclosure, and wherein said impeller chamber comprises a first chamber end wall and a second chamber end wall and a circumferential side wall sealingly interconnecting said first chamber end wall and said second chamber end wall, and wherein said first chamber end wall is said heat transfer wall and wherein said second chamber end wall comprises an outer periphery and a substantially central fluid entry port and a fluid exit port at said outer periphery of said second chamber end wall;

such that said fluid is delivered into said chamber through said fluid entry port and said fluid impinges upon an opposing substantially central region of said first chamber end wall and flows radially outward from the substantially central region in all directions, across said first chamber end wall and toward said circumferential side wall, and then diverts away from said first chamber end wall, through said fluid exit port and into said heat dissipating enclosure from which heat gathered from said heat source is dissipated into the outside environment, and the fluid within said heat dissipating enclosure then flows again through said fluid entry port into said chamber thereby completing a repeating flow cycle.

US 6,408,938 B2

HEAT EXCHANGER

Alan Gray, Oxon; Richard Kendall Bolingbroke, Newport, and John Michael Evans, Gwent, all of United Kingdom, assignors to Alcan International Limited, Montreal, Canada

PCT No. PCT/GB96/02843, § 371 Date Apr. 20, 1998, § 102(e) Date Apr. 20, 1998, PCT Pub. No. WO97/18946, PCT Pub. Date May 29, 1997

PCT Filed Nov. 19, 1996, Appl. No. 51,735

Claims priority, application United Kingdom, Nov. 21, 1995, 9523795

Int. Cl. F28F *13/18;19/02;* **B21D** *53/02;* **B23P** *15/26;* **C22C** *21/04*

U.S. Cl. 165—133 **8 Claims**

1. A brazed heat exchanger having fins consisting of an alloy consisting essentially of

Component	Wt %
Fe	0.2–0.5
Si	0.7–1.2
Mn	1.2–1.6
Mg	up to 0.3
Cu	0.27–0.5
Zn	up to 0.2
Ti	up to 0.1
Others	up to 0.05 each, 0.15 total
Al	Balance.

US 6,408,939 B1

DOUBLE HEAT EXCHANGER

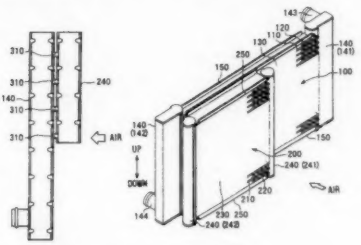
Tatsuo Sugimoto, Okazaki; Satomi Muto, Nishikasugai-gun, and Takaaki Sakane, Nagoya, all of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Mar. 27, 2000, Appl. No. 536,495

Claims priority, application Japan, Mar. 30, 1999, 11-089792; Aug. 27, 1999, 11-242097

Int. Cl. F28D *21/00;* **F28F** *13/00*

U.S. Cl. 165—140 **25 Claims**



1. The heat exchanger comprising:

a first heat-exchanging unit for performing heat exchange between a first fluid and air, said first heat exchanging unit includes

a plurality of first tubes through which said first fluid flows,

a plurality of first corrugated fins disposed between adjacent first tubes, and

a first tank portion disposed to communicate with said first tubes, at both longitudinal ends of each aid first tube;

a second heat-exchanging unit for performing heat exchange between a second fluid and air, said second heating-exchanging unit includes

a plurality of second tubes through which said second fluid flows, said second tubes extending in parallel with said first tubes,

a plurality of second corrugated fins disposed between adjacent said second tubes, and

a second tank portion disposed to communicate with said second tubes, at both longitudinal ends of each said second tube;

a side plate disposed in parallel with said first and second tubes, for reinforcing said first and second heat-exchanging units, wherein:

said first and second heat-exchanging units are disposed to be integrated through said side plate;

said second tubes have a tube dimension in a tube longitudinal direction of said second tubes, smaller than that of said first tubes, in such a manner that the first heat-exchanging unit has an overlapping portion overlapping with said second heat-exchanging unit in an air-flowing direction and a non-overlapping portion in the air-flowing direction;

in the overlapping portion, air passes through both said first heat-exchanging unit and said second heat-exchanging unit; and

in the non-overlapping portion, air only passes through the first heat-exchanging unit.

US 6,408,940 B1

HEATING, VENTILATION AND/OR AIR-CONDITIONING DEVICE INCLUDING A THERMAL LOOP EQUIPPED WITH AN EVAPORATOR

Said Naji, Elancourt, and Laurent Legot, Paris, both of France, assignors to Valeo Climatisation, La Verriere, France

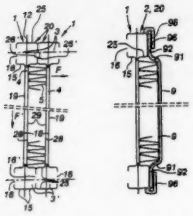
Filed Dec. 29, 1999, Appl. No. 474,820

Claims priority, application France, Dec. 30, 1998, 98 16635

Int. Cl. F28D *1/03*

U.S. Cl. 165—153 **3 Claims**

1. A heating, ventilation and/or air-conditioning device including a thermal loop equipped with a heat exchanger, the heat exchanger comprising:



a stack of orientation plates having first and second opposite longitudinal ends, and

a pair of end plates arranged at two opposite axial ends of the heat exchanger,

certain orientation plates having separation elements intended to divert a flow of cooling liquid circulating in an axial direction of the heat exchanger so as to direct the flow to a channel region in which the flow travels from one said end to the other in a longitudinal direction of the orientation plates,

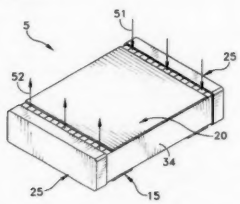
wherein an edge of one of said end plates is folded onto one face of one of said end plates to form stiffening means which is integral at least with one region of one of said separation elements.

US 6,408,941 B1

FOLDED FIN PLATE HEAT-EXCHANGER

Jon Zuo, Lancaster, Pa., assignor to Thermal Corp., Stanton, Del.

Filed Jun. 29, 2001, Appl. No. 898,774
Int. Cl. F28D *21/00*
U.S. Cl. 165—165 **8 Claims**



1. A heat-exchanger comprising a fin core comprising a continuous sheet of thermally conductive material folded into alternating flat ridges and troughs defining spaced fin walls having peripheral end edges, wherein each of said fin walls has a thickness of about 0.002 to 0.020 inches, and wherein at least one air-barrier plate is sealingly fastened to said flat ridges on a first side of said fin core, a liquid-barrier plate is sealingly fastened to said flat ridges on a second side of said fin core, and an open ended rectangular box shaped end cap is mounted over said peripheral end edges of said spaced fin walls so that air flows through selected ones of said troughs and liquid flows through selected other ones of said troughs.

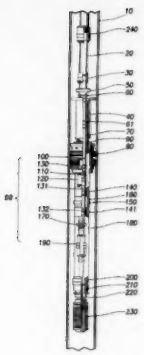
US 6,408,942 B2

ONE-TRIP SQUEEZE PACK SYSTEM AND METHOD OF USE

William J. Martin, Carencro, La., assignor to Halliburton Energy Services, Inc., Dallas, Tex.

Continuation of application No. 09/139,476, filed on Aug. 25, 1998, now Pat. No. 6,241,013. This application Apr. 11, 2001, Appl. No. 832,761.
Int. Cl. E21B *43/04*
U.S. Cl. 166—278 **13 Claims**

1. A method for well completion within a well that penetrates a zone of interest which allows a packing assembly and production



tubing to remain essentially in place during and between a gravel packing phase and a fluid capturing phase, said method comprising the steps of:

(a) running the packing assembly down the well on production tubing, said packing assembly comprising a packer and a ported sub;

(b) setting the packer;

(c) pumping a first fluid down the production tubing and into the formation; and

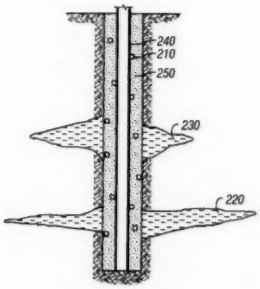
(d) allowing a production fluid to flow back up the production tubing.

US 6,408,943 B1

METHOD AND APPARATUS FOR PLACING AND INTERROGATING DOWNHOLE SENSORS

Roger Lynn Schultz, Denton; Clark Edward Robison, Plano; Russell Irving Bayh, III, Carrollton, all of Tex.; Benjamin Bernhardt Stewart, III, Aberdeen, United Kingdom; Brian George Nutley, Fareham, United Kingdom; Jamie George Oag, and Nadir Mahjoub, both of Aberdeen, United Kingdom, assignors to Halliburton Energy Services, Inc., Dallas, Tex.

Filed Jul. 17, 2000, Appl. No. 617,212
Int. Cl. E21B *33/13;47/00*
U.S. Cl. 166—285 **20 Claims**



1. A method of placing sensors in a borehole, the steps comprising:

drilling a borehole with a drill apparatus;

forming a well casing therein; and

placing at least one remote sensor into cement slurry as the well casing is being cemented;

wherein said remote sensor has no external connections.

US 6,408,944 B1

APPARATUS AND METHOD TO SHUT DOWN A PIPELINE

Juhani Niinivaara; Tarmo Niinivaara, both of Koria, and Tero Hurtta, Helsinki, all of Finland, assignors to AB Grundstenen (Metal Patent WHSS AB), Haparanda, Sweden

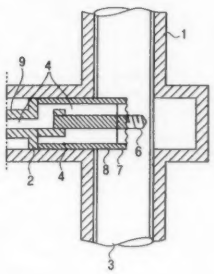
PCT No. PCT/FI98/01029, § 371 Date Aug. 17, 2000, § 102(e) Date Aug. 17, 2000, PCT Pub. No. WO99/37883, PCT Pub. Date Jul. 29, 1999

PCT Filed Dec. 30, 1998, Appl. No. 582,462

Claims priority, application Finland, Dec. 30, 1997, 974647

Int. Cl. E21B *29/00*

U.S. Cl. 166—298 **11 Claims**



1. A method of shutting down leaking oil or gas pipelines said method comprising the steps of:

placing a frame around the leaking pipeline, said frame comprising drilling equipment having a rotatable drill and a rotatable drill cylinder which are moveable transversally in relation to the direction of the pipeline;

boring a hole through the pipeline using the drill cylinder of drilling equipment;

inserting a plug cylinder in the bore to seal the pipeline to thereby shut off the pipeline;

simultaneous with said steps of boring a hole and inserting the plug cylinder, feeding a coolant through a channel inside the plug cylinder to cool the plug cylinder; and

ceasing the feeding of coolant through the channel enabling the plug cylinder to expand as a result of an elevation in the temperature for sealing the pipe in a tight manner.

US 6,408,945 B1

TOOL AND METHOD FOR REMOVING EXCESS CEMENT FROM THE TOP OF A LINER AFTER HANGING AND CEMENTING THEREOF

Geroge Telfer, Aberdeen, United Kingdom, assignor to Weatherford/Lamb, Inc., Houston, Tex.

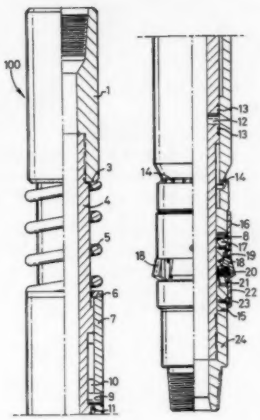
PCT No. PCT/GB98/00149, § 371 Date Oct. 28, 1999, § 102(e) Date Oct. 28, 1999, PCT Pub. No. WO98/35131, PCT Pub. Date Aug. 13, 1998

PCT Filed Jan. 16, 1998, Appl. No. 355,703

Int. Cl. E21B *34/00*

U.S. Cl. 166—311 **11 Claims**

1. A tool for use with a running tool for removing excess cement from the top of a liner after hanging and cementing thereof, the tool comprising a hollow mandrel, a valve sleeve, a spring acting on said valve sleeve and a first port in said hollow mandrel wherein said valve sleeve is movable to open and close said first port and wherein said valve sleeve is arranged substantially coaxially with said hollow mandrel wherein one of said valve sleeve and said hollow mandrel is provided with an indexing pin and the other of said hollow mandrel and said valve sleeve incorporates an irregular



surface, and wherein said spring biases said indexing pin against said irregular surface.

US 6,408,946 B1

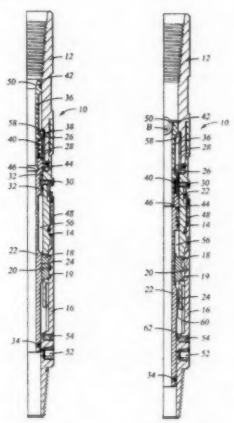
MULTI-USE TUBING DISCONNECT

Gregory S. Marshall, Magnolia, and Daniel R. Hart, Sugarland, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Apr. 28, 2000, Appl. No. 561,484

Int. Cl. E21B *23/04;34/10*

U.S. Cl. 166—317 **25 Claims**



1. A disconnect device for downhole use in oil or gas wells, comprising:

an upper tool body;

a dog housing mountable to said upper body;

a lower tool body;

at least one movable dog cried by said dog housing;

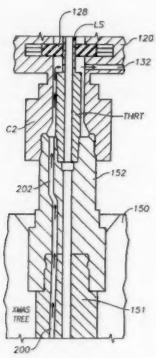
a collet adapted to selectively maintain said at least one dog in engagement with said lower body, thereby preventing longitudinal movement of said lower body relative to said dog housing; and

a piston slidably mounted at an initial position relative to said dog housing, wherein said piston is not in abutment with said collet,

wherein said piston is hydraulically movable from said initial position to a second position in which said piston abuts said

collet to move said collet longitudinally relative to said dog housing to release said at least one dog from engagement with said lower body.

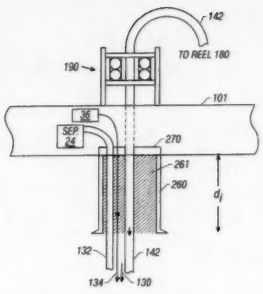
US 6,408,947 B1
SUBSEA CONNECTION APPARATUS
Christopher E. Cunningham, and Christopher D. Bartlett, both of Spring, Tex., assignors to FMC Corporation, Chicago, Ill.
Division of application No. 09/168,301, filed on Oct. 7, 1998, now Pat. No. 6,227,300, Provisional application No. 60/061,293, filed on Oct. 7, 1997. This application Oct. 9, 2000, Appl. No. 685,650.
Int. Cl. E21B *43/01;33/03*
U.S. Cl. 166—339 **20 Claims**



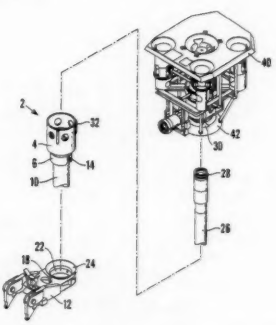
1. Subsea apparatus comprising,
a BOP adaptor having a main body having top and bottom ends,
said bottom end arranged and designed for connection to a standard xmas tree re-entry hub,
said top end having a top profile arranged and designed for a releasable connection to a connector which is coupled to a bottom end of drilling or completion equipment.

US 6,408,948 B1
TUBING HANDLING FOR SUBSEA OILFIELD TUBING OPERATIONS
Peter Fontana, Houston; James W. Macfarlane, Katy, and Roger W. Fincher, Conroe, all of Tex., assignors to Deep Vision LLC, Houston, Tex.
Provisional application No. 60/092,908, filed on Jul. 15, 1998, Provisional application No. 60/095,188, filed on Aug. 3, 1998. This application Jul. 14, 1999, Appl. No. 353,696.
Int. Cl. E21B *7/12;33/047;41/04*
U.S. Cl. 166—341 **4 Claims**

1. A subsea system for performing subsea oilfield tubing operations, comprising:
(a) a work station at the surface of an offshore location;
(b) a supply of tubing at the work station for supplying a string of work tubing extending down from a work platform to a subsea work location;
(c) a rig at the work station for moving the work tubing from the surface down to the subsea work location;
(d) a fluid return line extending from the subsea work location to the surface for return of the fluid to the work station, the return line being separated and spaced apart from the work tubing;
(e) a second, isolation tube of larger inner dimensions than the exterior dimensions of the work tubing surrounding an upper portion of the work tubing during subsea operations and extending down from adjacent the work station toward but stopping short of the subsea work location, with the size, rigidity and mechanical strength of the second, isolation tube being sufficient to mechanically protect said work tubing from exposure to turbulence in the sea adjacent the surface at the offshore location; and
(f) a device on the surface work station having separate openings allowing the passage of the work tubing and the return line therethrough, said device maintaining the return line and the work tubing in predetermined spaced relation when said platform rotates about the work tubing wherein the opening for the return line is a slot extending around the opening for the work tubing such that the return line is able to move at least partially around the work tubing.



US 6,408,949 B1
DEVICE FOR USE FOR MOUNTING AND ALIGNMENT OF A CHRISTMAS TREE ON A WELLHEAD
Patrice Aquilera, Hvalstad; Karl-Arne Bertelsen, Kongsberg, and Tore Knoph, Bindalseidet, all of Norway, assignors to Kongsberg Offshore A/S, Kongsberg, Norway
PCT No. PCT/NO98/00327, § 371 Date Sep. 5, 2000, § 102(e) Date Sep. 5, 2000, PCT Pub. No. WO99/23351, PCT Pub. Date May 14, 1999
PCT Filed Oct. 30, 1998, Appl. No. 530,646
Claims priority, application Norway, Nov. 3, 1997, 19975064
Int. Cl. E21B *33/038;33/035*
U.S. Cl. 166—368 **2 Claims**



1. A device for mounting and aligning a Christmas tree (**40**) which can be lowered from a platform on a wellhead (**28**) located on a seabed, said device comprising:
a side element (**12**) mountable on a drilling template;
a guide pipe (**10**) arranged to receive the wellhead, the side element (**12**) having a guiding device comprising a conical funnel (**24**) to receive the guide pipe; and
a substantially cylindrical adaptor (**2**),
wherein the adaptor comprises

a lower section (**6**) with alignment and orientation bodies (**14**) which are arranged to coact with bodies (**18**) of the side element (**12**),

a truncated cone-shaped intermediate section (**8**) which is adapted to the shape of the funnel (**24**) of the side element, and

an upper section (**4**), which has an outer diameter which is larger than the outer diameter of the lower section (**6**) and is adapted for insertion in a funnel (**42**) of the Christmas tree (**40**), and which has alignment and orientation bodies (**32**) adapted for coacting with corresponding orientation bodies (**30**) of the Christmas tree (**40**).

US 6,408,950 B1

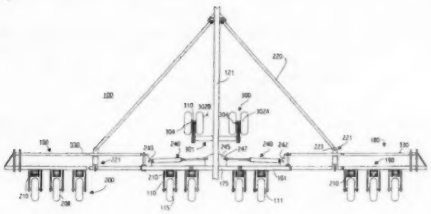
FOLDABLE IMPLEMENT FRAME AND HITCH

Kenneth E. Shoup, P.O. Box 121, Bonfield, Ill. 60913

Filed Apr. 20, 2000, Appl. No. 552,943

Int. Cl. A01B *49/00*

U.S. Cl. 172—311 **31 Claims**



1. A foldable implement frame and hitch having a front end for attachment to a draft vehicle, comprising a support frame connected to a main frame including at least two telescoping frame members, two wing frames pivotally mounted on said support frame respectively on either side of said main frame for movement between extended working positions wherein said wing frames are in general alignment with said support frame and retracted positions, motors operable for moving said wing frames between the extended working positions and the retracted positions, a plurality of field wheels mounted on said support frame and said wing frames for supporting said foldable implement frame on the ground when said wing frames are in the extended working positions, motors operable for moving said field wheels from ground engaging positions to stored positions, dedicated transport wheels mounted on one of said support and main frames movable between a stored position wherein the transport wheels are out of contact with the ground and a transport position wherein the dedicated transport wheels engage the ground and support the implement frame with the wing frames in retracted positions, and motors operable to move said dedicated transport wheels between the stored and transport positions, said transport wheels in the transport position being a substantial distance from said support frame toward the front end of said foldable implement frame.

US 6,408,951 B1

AUTOMATIC CABLE-CUTTING APPARATUS

Pi-Chu Lin, No. 79, Lane 716, Min-Sheng S. Rd., Chiayi City, Taiwan

Filed May 14, 2001, Appl. No. 854,584

Claims priority, application Taiwan, Jan. 18, 2001, 090201010

Int. Cl. B25D *11/10*

U.S. Cl. 173—203 **4 Claims**

1. A cable-cutting apparatus for cutting a cable, the cable being placed on a planar surface, said apparatus comprising:

a housing having a front end that is formed with an opening;

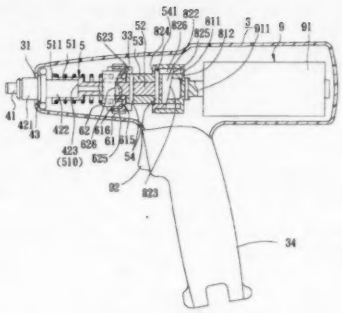
a cutter rod disposed movably in said housing and having a front end portion with a fixed blade that extends outwardly from said opening in said housing and that is adapted to press the cable against the planar surface, and a rear end portion with an engagement surface, said cutter rod being movable relative to said housing in a longitudinal direction of said cutter rod;

an impact rod disposed movably and non-rotatably in said housing and having a front end portion with an engagement surface, said impact rod being movable relative to said housing in the longitudinal direction of said cutter rod;

a resilient unit for biasing said engagement surface of said impact rod forward to press against said engagement surface of said cutter rod;

a driving unit disposed in said housing and including a switch; and

a rotating unit disposed rotatably in said housing and rotatable by said driving unit when said switch of said driving unit is actuated to move rearward said engagement surface of said impact rod away from said engagement surface of said cutter rod until said impact rod reaches a rear limit position, after which said impact rod is biased forward by said resilient unit so that said engagement surface of said impact rod impacts on said engagement surface of said cutter rod, thereby cutting the cable with said blade of said cutter rod.



US 6,408,952 B1

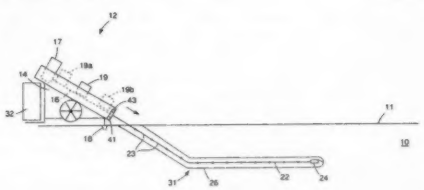
REMOTE LOCK-OUT SYSTEM AND METHOD FOR A HORIZONTAL DIRECTION DRILLING SYSTEM

Ivan R. Brand; Gregg A. Austin, and Fred G. Delonti, all of Pella, Iowa, assignors to Vermeer Manufacturing Company, Pella, Iowa

Filed Dec. 17, 1999, Appl. No. 466,502

Int. Cl. E21B *44/00*

U.S. Cl. 175—24 **33 Claims**



1. A method of remotely altering operation of a horizontal directional drilling machine, the drilling machine comprising a driving apparatus coupled to a drill string and a cutting head or reamer, the method comprising:

transmitting a lockout signal from a location remote from the drilling machine;

receiving the lockout signal at the drilling machine;

preventing movement of the drill string in response to the received lockout signal;

transmitting a verification signal from the drilling machine to the remote location, the verification signal indicative of success-

ful receipt of the lockout signal by the drilling machine and disablement of drill string movement; and

detecting a loss of communication connectivity between the drilling machine and the remote location.

US 6,408,953 B1

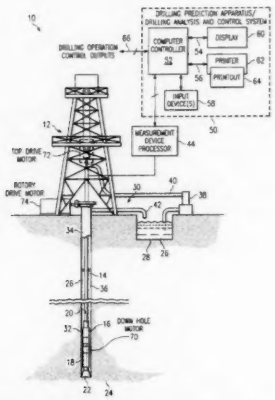
METHOD AND SYSTEM FOR PREDICTING PERFORMANCE OF A DRILLING SYSTEM FOR A GIVEN FORMATION

William A. Goldman, Houston; Oliver Matthews, III, Spring; William W. King, Houston; Gary E. Weaver, Conroe, and Gerald L. Pruitt, Houston, all of Tex., assignors to Halliburton Energy Services, Inc., Carrollton, Tex.

Continuation-in-part of application No. 09/192,389, filed on Nov. 13, 1998, now Pat. No. 6,109,368, which is a continuation-in-part of application No. 09/048,360, filed on Mar. 26, 1998, now Pat. No. 6,131,673, which is a continuation-in-part of application No. 08/621,411, filed on Mar. 25, 1996, now Pat. No. 5,794,720. This application Aug. 28, 2000, Appl. No. 649,495.

Int. Cl. E21B *47/00;44/00*

U.S. Cl. 175—39 **50 Claims**



1. An apparatus for predicting the performance of a drilling system for the drilling of a well bore in a given formation, said apparatus comprising:

means for generating a geology characteristic of the formation per unit depth according to a prescribed geology model and outputting signals representative of the geology characteristic, the geology characteristic including at least rock strength;

means for inputting specifications of proposed drilling equipment for use in the drilling of the well bore, the specifications including at least a bit specification of a recommended drill bit;

means for determining a predicted drilling mechanics in response to the specifications of the proposed drilling equipment as a function of the geology characteristic per unit depth according to a drilling mechanics model and outputting signals representative of the predicted drilling mechanics, the predicted drilling mechanics including at least one of the following selected from the group consisting of bit wear, mechanical efficiency, power, and operating parameters;

means responsive to a predicted drilling mechanics output signal for controlling a control parameter in drilling of the well bore with the drilling system, the control parameter including at least one selected from the group consisting of weight-on-bit, rpm, pump flow rate, and hydraulics;

means for obtaining a measurement parameter in real time during the drilling of the well bore; and

means for history matching the measurement parameter with a back calculated value of the measurement parameter, wherein the back calculated value of the measurement parameter is a function of the drilling mechanics model and at least one control parameter, and wherein responsive to a prescribed deviation between the measurement parameter and the back calculated value of the measurement parameter, said control means performs at least one of the following selected from the group consisting of a) adjusts the drilling mechanics model, b) modifies control of a control parameter, and c) performs an alarm operation.

US 6,408,954 B1

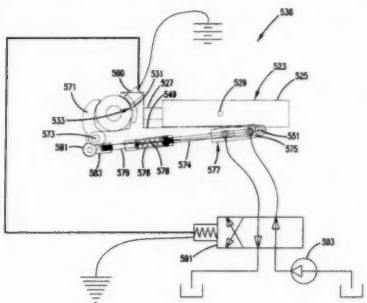
GRIPPING MECHANISM FOR A DIRECTIONAL DRILLING MACHINE

Trail Price, Monroe, and Scott Rempe, Pella, both of Iowa, assignors to Vermeer Manufacturing Company, Pella, Iowa

Filed Jun. 23, 2000, Appl. No. 602,796

Int. Cl. E21B *19/00;19/20*

U.S. Cl. 175—52 **10 Claims**



8. A method for moving a rod to a drill string of a horizontal drilling machine, the method comprising:

providing a transfer mechanism including: a transfer member having a rod receiving location; and a rod retainer moveable from a first position where the rod retainer is adapted to retain a rod at the rod receiving location and a second position in which the rod can be removed from or inserted into the rod receiving location;

retaining a rod in the rod receiving location by moving the rod retainer to the first position

moving the transfer member to bring the rod in alignment with a drill string;

connecting the rod to the drill string;

moving the transfer member away from the drill string thereby causing the rod to force the rod retainer from the first position toward the second position;

moving the rod retainer toward the second position in response to the force applied by the rod;

detecting when the transfer member has been moved a predetermined distance relative to the rod; and

causing an actuator to move the rod retainer to the second position when it is detected that the transfer member has been moved the predetermined distance relative to the rod.

US 6,408,955 B2

HYBRID SECTIONAL AND COILED TUBING DRILLING RIG

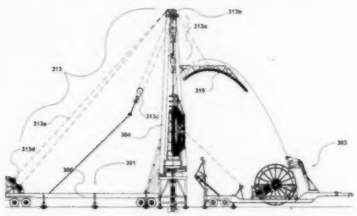
Thomas C. Gipson, Cisco, Tex., assignor to Precision Drilling Corporation, Canada

Division of application No. 09/569,965, filed on May 12, 2000, now Pat. No. 6,332,501. This application Mar. 23, 2001, Appl. No. 815,623.

Claims priority, application Canada, Feb. 3, 2000, 2298089

Int. Cl. E21B *19/02;19/22*

U.S. Cl. 175—57 **11 Claims**



1. A method of drilling a well with both sectional tubulars and coiled tubing comprising the steps of:

providing a hybrid drilling system having a mast having at least one open side and equipped for drilling with tubulars, at least one drawworks and a drive for rotating tubulars, and having a coiled tubing injector having supply of coiled tubing;

lifting the injector into the mast using the drawworks;

alternately drilling with tubulars or with coiled tubing; and

setting the injector aside in the mast when drilling with tubulars.

US 6,408,956 B1

FEED SYSTEM FOR A ROTARY DRILL TOWER

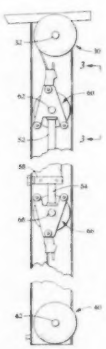
James E. Morris, Dallas; Steven M. Precopia, and Gary W. Howell, both of Garland, all of Tex., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

PCT No. PCT/US98/21721, § 371 Date Aug. 14, 2000, § 102(e) Date Aug. 14, 2000, PCT Pub. No. WO99/19593, PCT Pub. Date Apr. 22, 1999

Provisional application No. 60/062,058, filed on Oct. 15, 1997. This PCT application Oct. 14, 1998, Appl. No. 529,584.

Int. Cl. E21B *3/02*

U.S. Cl. 175—113 **25 Claims**



1. A rotary drill rig comprising:

(a) a drill platform:

(b) a derrick for carrying drill machinery, said derrick supported on said drill platform:

(c) a rotary powerhead for moving and rotating a drill string;

(d) a fixed pulley assembly on said derrick for supporting a flexible connector thereon;

(e) a movable pulley assembly on said derrick for supporting said flexible connector thereon and for moving back and forth along said derrick to move said rotary powerhead back and forth along said derrick; and

(f) a hydraulic cylinder rod assembly on said derrick for moving said movable pulley assembly back and forth, said cylinder assembly having at least one piston rod reciprocable within a cylinder casing, said cylinder casing immovably fixed to said derrick, whereby said piston rods are maintained in tension during operation thereof.

US 6,408,957 B1

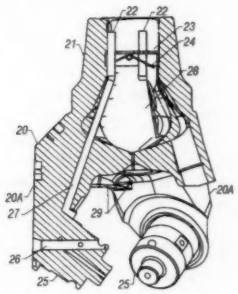
SEALED BEARING ROLLER CONE BIT HAVING ANTI-PLUGGING DEVICE

Robert H. Slaughter, Jr., Ponca City; Fakhroldin M. Jadbabaei, Stillwater; Peter T. Cariveau, Ponca City; Vincent W. Shotton, Ponca City, and Roger Didericksen, Ponca City, all of Okla., assignors to Smith International, Inc., Houston, Tex.

Filed Aug. 23, 2000, Appl. No. 644,595

Int. Cl. E21B *27/00*

U.S. Cl. 175—235 **8 Claims**



1. A roller cone drill bit, comprising:

a bit body having at least one leg depending therefrom, the at least one leg having a journal formed thereon at a lower end, the bit body including an air channel extending at least from an interior of the bit body to a seal area on the journal;

a roller cone sealingly, rotatably mounted on the journal, the cone having a plurality of cutting elements disposed thereon; and

at least one backflow valve disposed in the bit body so that an intake end of the air channel is disposed upstream of the backflow valve.

US 6,408,958 B1

SUPERABRASIVE CUTTING ASSEMBLIES INCLUDING CUTTERS OF VARYING ORIENTATIONS AND DRILL BITS SO EQUIPPED

Matthew R. Isbell; Rudolf C. O. Pessier, both of Houston; Michael L. Doster, Spring; Mark W. Dykstra, Kingwood, and William H. Heuser, The Woodlands, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

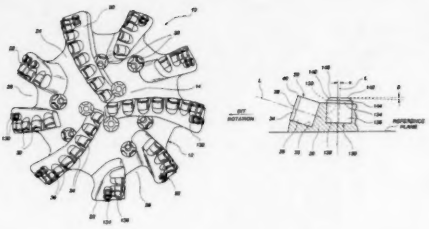
Filed Oct. 23, 2000, Appl. No. 694,518

Int. Cl. E21B *10/16*

U.S. Cl. 175—431 **40 Claims**

1. A cutting assembly for a drill bit for drilling subterranean formations, the cutting assembly comprising:

at least one first cutting element comprising a first superabrasive table having a cutting face, a side and a first cutting edge defined at the side along a peripheral portion of the cutting face, the first superabrasive table being positioned in an orientation suitable for engaging a formation with the first cutting edge; and



a second cutting element positioned adjacent the at least one first cutting element, the second cutting element comprising a second superabrasive table having a clearance face exhibiting a first lateral extent along a portion thereof, a side edge exhibiting a second lateral extent greater than the first lateral extent and in proximity to the first lateral extent, a rake face located between the clearance face and the side edge along a peripheral portion of the clearance face, and a second cutting edge defined between the clearance face and the rake face, the second cutting element being positioned in an orientation suitable for engaging the formation with the second cutting edge.

US 6,408,959 B2

POLYCRYSTALLINE DIAMOND COMPACT CUTTER HAVING A STRESS MITIGATING HOOP AT THE PERIPHERY

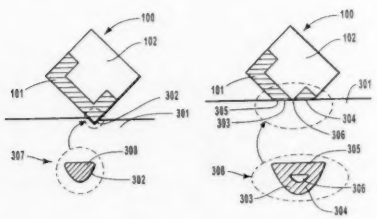
Kenneth E. Bertagnolli, 565 E. 11125 South, Sandy, Utah 84070, and Kenneth M. Jensen, 275 E. 1075 North, Springville, Utah 84663

Continuation of application No. 09/157,074, filed on Sep. 18, 1998, now Pat. No. 6,189,634. This application Feb. 19, 2001, Appl. No. 788,950.

This patent is subject to a terminal disclaimer.

Int. Cl. E21B *10/36*

U.S. Cl. 175—432 **5 Claims**



1. A polycrystalline diamond compact for use on a bit for drilling subterranean formations, comprising:

(A) a substrate having a bottom surface, a top surface and having a peripheral edge on said top surface, wherein said top surface of said substrate provides a shelf and

(B) a layer of superabrasive material, having an interface region where said superabrasive layer is bonded to said top surface of said substrate and wherein said layer of superabrasive material further comprises a hoop extending onto said shelf of said top surface of said substrate, and wherein said layer of superabrasive material is of uniform composition throughout.

US 6,408,960 B1

MOBILE AGRICULTURAL MACHINE

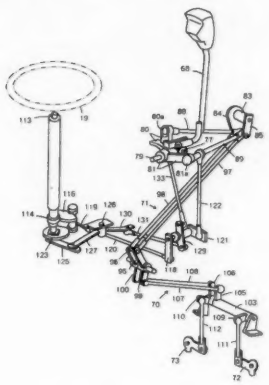
Shigehiro Hidaka, and Daigo Yokoyama, both of Osaka, Japan, assignors to Yanmar Agricultural Equipment Co., Ltd., Japan

Division of application No. 09/155,496, filed as application No. PCT/JP97/04163, filed on Nov. 14, 1997, now Pat. No. 6,152,248. This application Sep. 25, 2000, Appl. No. 668,160.

Claims priority, application Japan, Jan. 23, 1997, 9-25920; Sep. 12, 1997, 9-268-027; Sep. 17, 1997, 9-272220

Int. Cl. B62D *11/16*

U.S. Cl. 180—6.38 **76 Claims**



1. A mobile agricultural machine, comprising:

a pair of right and left traction members;

a transmission;

a main speed change device operable to transmits at any speed ratio a driving force from an engine through said transmission to said traction members so that said traction members are individually driven at any traveling speed;

a steerage means; and

a steering device operable to cause said steerage means to differentiate the traveling speeds between said traction members, characterized in that both said transmission and steerage means have respective power-transmitting structures constructed such that a normal running load at the highest speed is substantially equal to a maximum traveling load when swiveling.

US 6,408,961 B1

APPARATUS FOR DRIVING HAND-OPERATED WHEELCHAIR

Sen-Jung Chen, No. 236, Sec. 3, Ho-Ping W. Rd., Taipei City, Taiwan

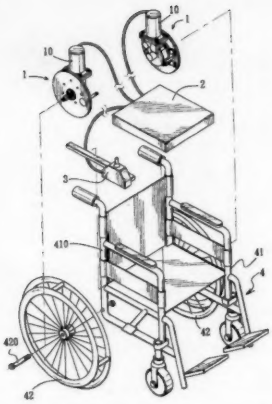
Filed Oct. 3, 2000, Appl. No. 678,588

Int. Cl. B62D *5/04*

U.S. Cl. 180—6.5 **6 Claims**

1. An apparatus for driving electrically a hand-operated wheelchair, the wheelchair including a chair frame that has two vertical rod portions, and two axle holes that are formed through the rod portions, respectively, and two wheels that are mounted rotatably on two opposite sides of the chair frame, each of the wheels having a hub which has two opposite sides, each of which is provided with a plurality of pairs of spokes that extend therefrom, the hub and each pair of the spokes defining cooperatively a generally triangular space thereamong in a respective one of the wheels, said apparatus comprising:

two driving devices each of which includes a motor unit that is provided with a motor shaft, and a transmission unit that is adapted to be mounted removably on a respective one of the wheels so as to transfer rotation of said motor shaft to the



respective one of the wheels in such a manner that each of the wheels rotates at a speed smaller than that of the respective motor shaft;

a power supply device adapted to be disposed on the chair frame for supplying electrical power to said motor units of said driving devices; and a control device which controls speed ratios of said motor shafts of said motor units of said driving devices so as to be adapted to steer the wheelchair;

wherein said transmission unit of each of said driving devices is provided with a reduction gearing, each of said driving devices further including:

a vertical disk;

a fastener unit adapted to attach said disk removably to the chair frame; and

a housing disposed removably on said disk so as to house the respective reduction gearing therein, thereby retaining the respective reduction gearing between said disk and said housing;

wherein said fastener unit of each of said driving devices includes:

a horizontal threaded rod fixed to said disk at an end thereof and adapted to extend through a respective one of the axle holes in the chair frame;

an annular first clamping block sleeved on said threaded rod and having a curved surface that is adapted to abut against a respective one of the rod portions of the chair frame;

two second clamping blocks fixed to said disk one above another, said threaded rod being located between said second clamping blocks, each of said second clamping blocks having a curved surface that is adapted to abut against a respective one of the rod portions of the chair frame so as to clamp the respective one of the rod portions between said first clamping block and said second clamping blocks; and

a cross-shaped handle engaging threadably said threaded rod and connected rotatably and non-movably to said first clamping block, assembly of said first clamping block and said handle serving as a lock nut.

US 6,408,962 B1

CONVERTIBLE SLED FOR TRANSPORTING LARGE GAME

Jason Ryckman, N85 W15041 MacArthur Dr., Menomonee Falls, Wis. 53051

Filed Apr. 21, 2000, Appl. No. 556,846

Int. Cl. B62B *13/18;* **B62D** *55/04*

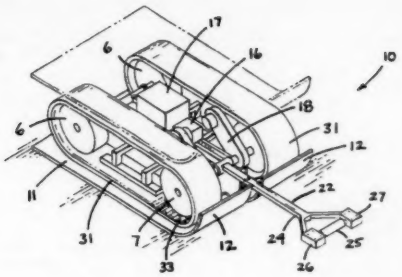
U.S. Cl. 180—9.22 **11 Claims**

1. A device to assist a hunter in extracting the carcass of a large game animal from a hunting site which comprises

a central frame,

a collapsible means for pulling the central frame,

a pair of front track idler rollers situated to either side of the central frame,



a pair of rear track idler rollers situated to either side of the central frame,

a pair of continuous tracks situated to either side of the central frame and supported by the front and rear track idler rollers,

means for powering said continuous tracks,

a plurality of sled body support members that are rotatable, each support member having a first end attached to the central frame and a second end, said first end being fixable both orthogonally upwardly and downwardly from the central frame,

a detachable sled body fixable to the second ends of each of the plurality of sled body support members, said sled body positionable either above or below the central frame,

a pair of rotatable wheel supports, each wheel support opposing the other and extending axially generally outwardly from the central frame,

a pair of wheel support arms, each support arm being rotatable about the axis of one wheel support and each support arm having a first end that is proximal to one wheel support and also having a distal end, and

a pair of wheels, one wheel being attached to the distal end of each wheel support arm,

wherein each of said wheels, wheel supports and wheel support arms may be rotated upwardly so as not to contact the ground and downwardly so as to support the device while it is being pulled over the ground.

US 6,408,963 B1

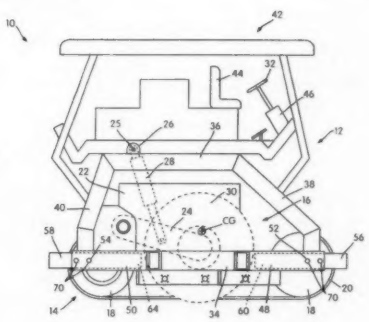
VEHICLE WITH COUNTERBALANCE STRUCTURE FOR OFFSETTING LONGITUDINALLY OFF-CENTER LOADS

John B. Lansberry, Woodland, Pa., assignor to Lansberry Tractor Company, Inc., Woodland, Pa.

Provisional application No. 60/156,451, filed on Sep. 28, 1999. This application Sep. 27, 2000, Appl. No. 669,887.

Int. Cl. B62D *55/02*

U.S. Cl. 180—9.34 **7 Claims**



1. A vehicle comprising:

a main frame having first and second opposing longitudinal end portions,

a driving track assembly mounted to said main frame and including an endless ground engaging track that extends generally in a longitudinal direction of said vehicle;

a pair of secondary driving assemblies mounted to said frame on opposing lateral sides of said track assembly in flanking relation, each of said secondary driving assemblies including a ground engaging driving structure spaced laterally from said endless track;

an engine assembly constructed and arranged to supply power to said track assembly and said secondary driving assemblies;

said driving track assembly being constructed and arranged to move said endless track using power supplied from said engine assembly to affect a vehicle driving operation wherein said endless track engages the ground to drive said vehicle in the longitudinal direction of the vehicle;

each of said secondary driving assemblies being constructed and arranged to operate said ground engaging driving structures using power supplied from said engine assembly so as to impart force to said vehicle;

a steering system operatively connected to said secondary driving assemblies and being constructed and arranged to control operation of said secondary driving assemblies so as to affect a vehicle steering operation wherein said ground engaging driving structures are operated to turn said vehicle with respect to said longitudinal direction;

a first counterbalance structure at the first end portion of said main frame selectively fixedly mounted to said main frame for longitudinal movement from a first fixed longitudinally inward position through a range of first fixed operating positions spaced longitudinally outwardly thereof in the direction of said first end portion so that in each of said first operating positions said first counterbalance structure applies a counterbalancing force to said main frame that tends to shift said vehicle's center of gravity towards the first longitudinal end portion of said main frame;

said first counterbalance structure being constructed and arranged to have removably mounted thereon a first removable functional attachment, and

a second counterbalance structure at said second end portion structure of said main frame selectively fixedly mounted to said main frame for longitudinal movement from a second fixed longitudinally inward position through a range of a second fixed operative position spaced longitudinally outwardly thereof in the direction of said second end portion so that in each of said second operative positions said second counterbalance structure applies a counterbalancing force to said main frame that tends to shift said vehicle's center of gravity towards the second end portion of said main frame,

said second counterbalance structure being constructed and arranged to have removably mounted thereon a second removable functional attachment.

US 6,408,964 B1

WHEEL AND TRACK DRIVING EQUIPMENT

Su-Eub Roh, Doo San Apt. 106-1003, Um Sa-Li, Doo Ma-Myon, Mon San-City, Chung Choung Nam-Do 320-195, Rep. of Korea

Filed Dec. 11, 2000, Appl. No. 732,753

Claims priority, application Rep. of Korea, Dec. 13, 1999, 99-57198

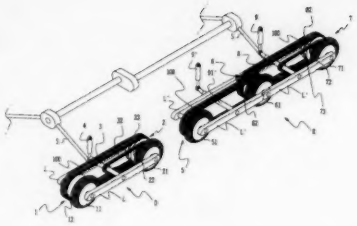
Int. Cl. B62D *55/02*

U.S. Cl. 180—9.34 **4 Claims**

1. Wheel and track driving equipment comprising a front wheel driving section and a rear wheel driving section provided at the rear of the front wheel driving section, wherein the front wheel driving section comprises:

a first running unit including an integral group of a wheel and a track wheel;

a second running unit including an integral group of wheel, a front drive gear and a track wheel;



a pair of connections including a track and a front link connection L between the first running unit and the second running unit; and

a buffer unit, wherein the rear wheel driving section comprises:

a third running unit including an integral group of a wheel and a track wheel;

a fourth running unit including an integral group of a wheel and a track wheel;

a fifth running unit including an integral group of a wheel, a rear drive gear and a track wheel;

a pair of connections including the track and a rear link connection between the third and fourth running units and the fifth running unit;

and a buffer unit.

US 6,408,965 B1

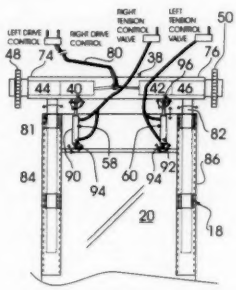
HYDRAULIC TRACK DRIVE WITH HYDRAULIC TRACK TENSIONERS

Sonny Grant, P.O. Box 7186, Spanish Fort, Ala. 36577

Filed Dec. 14, 2000, Appl. No. 737,522

Int. Cl. B62D *55/30*

U.S. Cl. 180—9.62 **1 Claim**



1. A hydraulic track drive with hydraulic track tensioners comprising:

a drive chassis including a cab support structure and left and right sets of plurality of pairs of free-wheeling pneumatic tires rotatably mounted, respectively to, left and right wheel structures of the drive chassis;

left and right loops of drive track;

a housing assembly;

left and right hydraulic motors;

left and right drive sprockets;

left and right drive hydraulic pumps;

left and right drive control valving;

left and right track tensioner assemblies;

tension control valving;

a tensioner assembly hydraulic pump;

left and right chain guides; and

a pump drive motor for driving the tensioner assembly hydraulic pump and the left and right hydraulic motors;

the left and right loops of drive track each being moveably entrapped around respectively, a left or a right set of the

plurality of pairs of free-wheeling pneumatic tires, a left or a right chain guide and a respective left or right drive sprocket;

each of the left and right loops of drive track having an inwardly facing track drive track chain along the entire length thereof;

each pair of free-wheeling pneumatic tires having an inner pneumatic tire and an outer pneumatic tire between which a drive track chain gap is provided;

each drive track chain gap of each pair of free-wheeling pneumatic tires being in alignment with each of the drive track chain gaps of its respective set such that a track drive track chain passageway is formed therebetween for passage of the track drive track chain of the respective loop of drive track;

each of the chain guides being supported by the drive chassis above its respective track drive track chain passageway;

each of the chain guides being open at the track drive facing surface thereof and sized to receive and slidably support sections of the inwardly facing track drive track chain of a respective left or right loop of track drive as the respective left or right loop of track drive is forced along a closed path by the respective left or right drive sprocket;

the respective left or right drive sprocket each being in alignment with its respective track drive track chain passageway and meshed with its respective track drive track chain of its respective loop of drive track such that rotation of the respective left or right sprocket causes a movement of the respective loop of drive track and the respective set of the plurality of pairs of free-wheeling pneumatic tires;

the housing assembly having the left and right hydraulic motors housed within respective left and right ends thereof, hydraulic lines in connection with the left and right hydraulic motors extending from the housing assembly and in connection with the left and right drive control valving and the left and right hydraulic pumps such that an operator can control the speed and direction of each of the left and right hydraulic motors;

the left and right sprockets being driven, respectively, by the left or right hydraulic motor;

the housing assembly being moveably coupled to the drive chassis by spaced left and right slide members each slidably supported within one of two spaced slide member receiving tubes by a pair of resilient bushings;

each slide member receiving tube being in a rigidly supported position with respect to the drive chassis;

the left and right track tensioner assemblies each including a respective left or right double acting hydraulic cylinder mechanically coupled between the drive chassis and an exterior of the housing assembly such that the housing assembly is moveable in all three planes with respect to each of the left or right double acting hydraulic cylinders;

the left or right double acting hydraulic cylinders each being in hydraulic connection with the tension control valving and the tensioner assembly hydraulic pump such that an operator can adjust the tension applied to a respective left or right loop of drive track by the respective left and right sprocket by operation of the tension control valving;

the tension control valving, the left and right drive control valving, the tensioner assembly hydraulic pump, the left and right hydraulic pumps, and the hydraulic pump drive motor beir ᵹ supported by the drive chassis.

US 6,408,966 B1

FUEL CELL VEHICLE

Uwe Benz, Uhldingen-Muehlof; Gerald Hornburg, Elchingen, and Werner Tillmetz, Wesserburg, all of Germany, assignors to Xcellsis GmbH, Kirchheim/Teck-Nabern, Germany

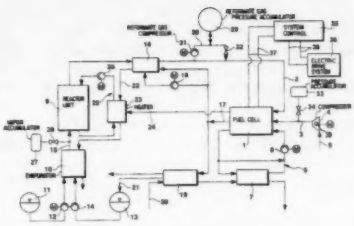
Filed Jul. 23, 1998, Appl. No. 120,801

Claims priority, application Germany, Jul. 23, 1997, 197 31 642

Int. Cl. H01M *8/18*

U.S. Cl. 180—65.1 **12 Claims**

1. A fuel cell vehicle, comprising:



an electric drive system having at least one electric motor and being adapted for regenerating braking energy, said electric drive system being connected to a system control;

a fuel cell system comprising a fuel cell stack for providing electric energy to the electric drive system and connected to the control system by electric connection lines;

a compressor coupled in fluid communication with the fuel cell stack for compressing oxygen-containing gas for the fuel cell stack and adapted to be operated by regenerated braking energy from the electric drive system; and

a pressure accumulator connected to a compressor outlet for storing additionally-compressed oxygen-containing gas from the compressor.

US 6,408,967 B1

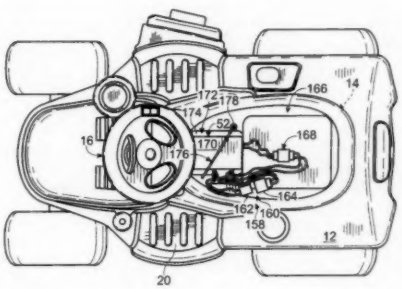
BUBBLE-PRODUCING RIDE-ON VEHICLE

Kurt J. Huntsberger, Chaffee, and John L. Jones, Jr., East Aurora, both of N.Y., assignors to Mattel, Inc., El Segundo, Calif.

Continuation-in-part of application No. 09/499,585, filed on Feb. 7, 2000. This application Jul. 31, 2000, Appl. No. 629,554.

Int. Cl. B60K *1/00*; **B05B** *9/00*

U.S. Cl. 180—65.1 **29 Claims**



1. A children's ride-on vehicle, comprising:

a vehicle body having a seat;

at least one steerable wheel rotatably coupled to the body;

a drive assembly;

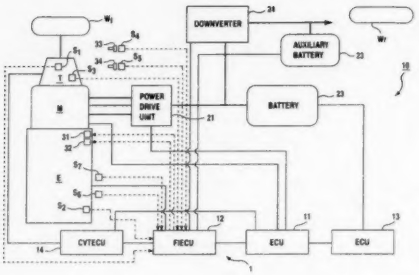
at least one driven wheel coupled to the drive assembly and adapted to be rotatably driven thereby; and

a bubble mechanism chargeable with a volume of bubble solution and adapted to produce bubbles therefrom, wherein the bubble mechanism includes a rotatable bubble wheel and an electrically-powered fan assembly adapted to deliver an airflow to the bubble wheel, and further wherein the bubble wheel is adapted to be rotationally driven by the airflow.

US 6,408,968 B1
CONTROL SYSTEM FOR HYBRID VEHICLE

Teruo Wakashiro; Atsushi Matsubara; Shinichi Kitajima; Kan Nakaune; Morio Kayano, and Kazunori Watanabe, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 2000, Appl. No. 638,071
Claims priority, application Japan, Aug. 17, 1999, 11-230914
Int. Cl. B60K *6/00*
U.S. Cl. 180—65.3 **3 Claims**



1. A hybrid vehicle control system of a vehicle having an engine providing propulsion force to said vehicle; a motor assisting said engine in providing propulsion force of said vehicle in accordance with an operational state of said vehicle; and an electricity storage device storing energy generated when said motor is employed as a generator driven by said engine, and storing energy generated during a regenerative state of said motor when said vehicle decelerates, said hybrid vehicle control system comprising:

an electricity storage device temperature detector for detecting temperature of said electricity storage device;

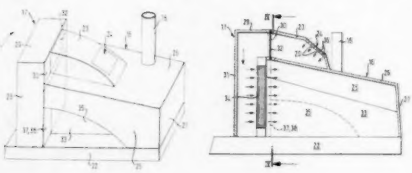
an engine water temperature detector for detecting water temperature of said engine; and

a power generation increasing device for increasing an amount of energy generated by said motor when said motor is used as a generator driven by said engine, either when said electricity storage device temperature is detected at or below a predetermined electricity storage device temperature by said electricity storage device temperature detector, or when said engine water temperature is detected at or below a predetermined temperature by said engine water temperature detector.

US 6,408,969 B1
ROAD ROLLER

Horst Lobert, Aschersleben, and Jorg Kehler, Gatersleben, both of Germany, assignors to Vibromax Bodenverdichtungsmaschinen GmbH, Gatersleben, Germany

PCT No. PCT/EP99/02350, § 371 Date Sep. 22, 2000, § 102(e) Date Sep. 22, 2000, PCT Pub. No. WO99/48716, PCT Pub. Date Sep. 30, 1999
PCT Filed Mar. 26, 1999, Appl. No. 647,106
Claims priority, application Germany, Mar. 26, 1998, 298 05 539 U
Int. Cl. B60K *11/00*
U.S. Cl. 180—68.1 **10 Claims**



1. A road roller comprising:

a chassis frame;

an encapsulated engine;

wheels driven by said engine;

a radiator through which cooling air flows;

a hood being air communicatingly connected with said radiator and covering said engine and guiding said cooling air; and

a housing separated from said hood and accommodating said radiator;

wherein said hood comprises a fitting having an air intake for drawing in said cooling air from above, said fitting being closed off air-tight relative to an engine compartment of said hood and in an air-flow connection with said housing;

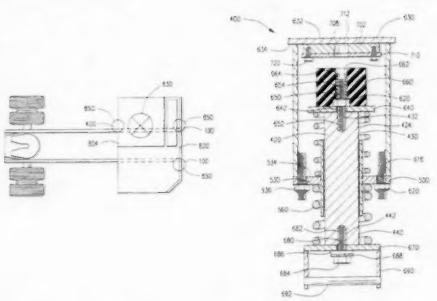
wherein said housing has a backplate which deflects said cooling air flowing through said fitting and entering said housing to flow through said radiator and to enter said engine compartment of said hood; and

wherein said hood further comprises sideplates which are provided with an air outlet for exit of said cooling air entering said hood downwards in the region of said wheels.

US 6,408,970 B1
CAB SUSPENSION SYSTEM FOR TERMINAL TRACTORS

Allen L. Eng, 713 Knights Bridge Rd., Edmond, Okla. 73034

Filed Aug. 28, 2000, Appl. No. 648,425
Int. Cl. B62D *33/06;* **B60J** *7/00*
U.S. Cl. 180—89.12 **5 Claims**



1. A three point terminal tractor cab suspension system mounted to the front frame and rear frame of a terminal tractor having a pivot cab, the three point terminal tractor cab suspension system comprising:

a. two front suspension assemblies, including:

1. a support shaft, having a smooth outer surface, a first end and a second end;

2. a sleeve assembly, having cylindrical vertical sleeve with an inner surface and an outer surface, the inner surface containing an inner sleeve bushing, such inner sleeve bushing slidably engaging the smooth outer surface of the support shaft, the outer surface of the cylindrical vertical sleeve attached within a central vertical sleeve bore of a sleeve mounting plate, the sleeve mounting plate having an upper surface, a lower surface and sleeve retainer stud holes;

3. a rebound coil spring placed upon the second end of the support shaft below the sleeve mounting plate, secured to such second end by an inner capture plate, the inner capture plate having a lower surface to which an elastomeric spring is affixed;

4. a carrier coil spring placed upon the first end of the support shaft above the sleeve mounting plate, secured to such first end by a pivot bushing mounting plate having an upper surface to which a pivot bushing having an inner rubber bushing and an outer metal sleeve is attached; and

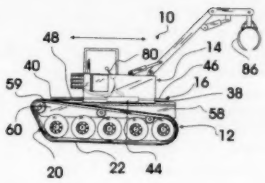
5. a carrier housing having an upper end and a lower end, the upper end of the carrier housing attached to the lower surface of the sleeve mounting plate, the lower end of the

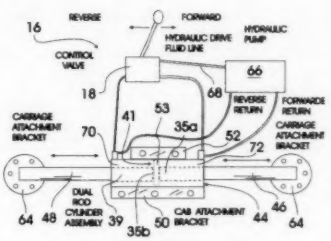
carrier housing having a housing end plate having a central bore, wherein the support shaft, the carrier coil spring, the rebound coil spring, inner capture plate and the elastomeric spring are suspended within the carrier housing, the carrier housing end plate attaching to the front frame of the terminal tractor with the pivot bushing pivotally attached to the pivot cab of the terminal tractor; and

b. a single rear suspension assembly

1. a support shaft, having a smooth outer surface, a first end and a second end;
2. a sleeve assembly, having cylindrical vertical sleeve with an inner surface and an outer surface, the inner surface containing an inner sleeve bushing, such inner sleeve bushing slidably engaging the smooth outer surface of the support shaft, the outer surface of the cylindrical vertical sleeve attached within a central vertical sleeve bore of a sleeve mounting plate, the sleeve mounting plate having an upper surface and a lower surface;
3. a rebound coil spring placed upon the first end of the support shaft above the upper surface of the sleeve mounting plate, secured to such first end by an inner capture plate, the inner capture plate having an upper surface to which an elastomeric spring is affixed;
4. a carrier coil spring placed upon the second end of the support shaft below the lower surface of the sleeve mounting plate, secured to such second end by a latch plate having a lower surface to which a latch catch assembly, having a pair of latch stirrups and a latch bar are attached; and
5. a carrier housing having an upper end and a lower end, the lower end of the carrier housing attached to the upper surface of the sleeve mounting plate, the upper end of the carrier housing having a housing end plate having a lower surface to which a rebound faceplate and a rebound spacer are attached, wherein the support shaft, the carrier coil spring, the rebound coil spring, inner capture plate and the elastomeric spring are suspended within the carrier housing, the elastomeric spring situated directly below the rebound faceplate and rebound spacer, the carrier housing end plate attaching to the cab of the terminal tractor, with the latch assembly aligned above the rear frame of the and rebound spacer, the carrier housing end plate attaching to the cab of the terminal tractor, with the latch assembly aligned above the rear frame of the terminal tractor releaseably engaging a latch catch assembly lock mounted to the rear frame of the terminal tractor,

the two front suspension assemblies and the rear suspension assembly suspending the pivot cab of the terminal tractor above the front and rear frame of the terminal tractor at three points of suspension.





positionable within and between opposed ends of the piston cylinder of the cylinder barrel, a hydraulic pump having hydraulic outputs in connection with the dual rod hydraulic cylinder assembly through a hydraulic control valve for controlling movement of the cylinder barrel with respect to the piston head of the cylinder barrel such that the cab assembly moves forward and rearward in connection with the cylinder barrel with respect to the tracked chassis assembly in response to movement of the cylinder barrel with respect to the two opposed piston rods;

the hydraulic control valve being positioned on the hydraulic cab assembly such that operation of the hydraulic control valve allows an operator positioned in the cab assembly to position the cab assembly forward and rearward on the tracked chassis assembly such that the weight of the cab assembly and any load supported by the cab assembly is positioned to provide the most balanced load on the tracks of the tracked chassis assembly to prevent sections of the tracks from bearing greater weight loads than other sections of the tracks and thereby allow the combined weight of the tracked vehicle with load balancing system to be spread over a larger earth contacting surface area of the tracks such that the tracked vehicle with load balancing system may be operated on soils with lower load bearing capacities than a substantially identical tracked vehicle without the load balancing system.

US 6,408,971 B1
TRACKED VEHICLE WITH LOAD BALANCING SYSTEM
Sonny Grant, P.O. Box 7186, Spanish Fort, Ala. 36577
Filed Aug. 14, 2000, Appl. No. 638,449
Int. Cl. B62D *33/06*
U.S. Cl. 180—89.13 **1 Claim**

1. A tracked vehicle with load balancing system comprising:

a tracked chassis assembly having a pair of tracks and a cab attachment rail assembly;

a cab assembly slidably mounted to the cab attachment rail assembly such that the cab assembly slides between a forward cab position and a rearward cab position with respect to the tracked chassis assembly; and

a cab assembly positioning assembly including a dual rod hydraulic cylinder assembly including a cylinder barrel connected to the cab assembly and two opposed piston rods; the cylinder barrel having a piston cylinder defined therein along the length thereof; each of the two opposed piston rods having a rod end connected to an opposed tracked chassis assembly end and a piston head end attached to a piston head slidably

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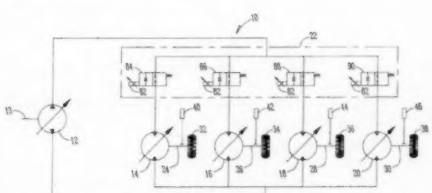
US 6,408,972 B1
ELECTRONIC TRACTION CONTROL SYSTEM
Randy J. Rodgers, Ames, Iowa, and Nianzhu Luo, Easley, S.C., assignors to Sauer-Danfoss Inc., Ames, Iowa
Filed Nov. 17, 2000, Appl. No. 715,659
Int. Cl. B60K *7/00*
U.S. Cl. 180—197 **2 Claims**



1. An electronic traction control for a vehicle having multiple hydraulically driven wheels comprising:

a hydraulic pump;

a plurality of hydraulic drive motors each fluidly connected to the pump for driving one of the wheels;

a plurality of speed sensors corresponding in number to the plurality of drive motors for generating a motor speed signal for each of the drive motors;

an electronic flow control valve comprising a microcontroller electrically connected to the speed sensors for receiving and comparing the motor speed signals and a plurality of normally open proportional solenoid-operated spool valves each electrically connected to the microcontroller for receiving a flow restricting command signal therefrom based upon comparison of the motor speed signals, the anti-slip valve being fluidly connected to one of the drive motors and operatively located between said drive motor and the pump;

the spool valves including a housing having a spool bore and first and second ports therein, the spool valve including an elongated hollow valve spool slidably mounted in the spool bore and having a predetermined range of travel therewithin, the valve spool including a first plurality of metering holes extending therethrough and in fluid communication with the first port and a second plurality of metering holes extending therethrough and in fluid communication with the second port, the first and second plurality of metering holes being spaced apart and at least partially registered with the first and second ports respectively such that some fluid flow is permitted from the second port to the first port through the metering holes throughout the entire range of travel of the valve spool.

US 6,408,973 B1

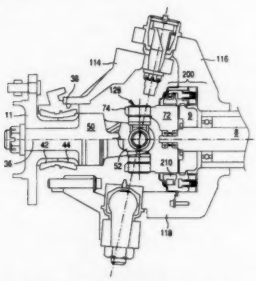
WHEEL END DISCONNECT SYSTEM

Peter Alfred Beesley, and Steven G. Goddard, both of Fort Wayne, Ind., assignors to Spicer Technology, Inc., Fort Wayne, Ind.

Filed Oct. 26, 2000, Appl. No. 696,175

Int. Cl. B60K *17/34*

U.S. Cl. 180—253 **14 Claims**



1. A wheel end system for a vehicle including a clutch adapted to provide driving engagement/disengagement of a wheel to convert between driven and non-driven modes of wheel movement, said system comprising:

a drive element adapted to be rotated by a differential assembly, said drive element comprising a drive axle extending from said differential assembly and supported within an axle tube by a bearing assembly at an output terminal end of said axle tube;

a wheel end adapted to be driven by said drive element in said driven mode;

a steerable joint interposed between said drive element and said wheel end to permit said wheel end to pivot with respect to said drive element; and

a clutch member mounted outboard of said bearing assembly and inboard of said steerable joint between said drive element and said steerable joint, said clutch member movable between a first position where said drive element is coupled to an input member of said steerable joint to produce a driving connection therebetween whereby the wheel end is driven by powered rotation of the drive element and a second position in which no driving connection is produced permitting the wheel end to rotate freely of the drive element.

US 6,408,974 B1

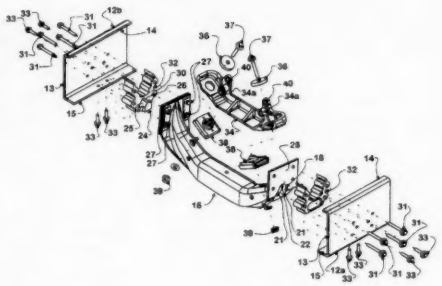
COMPONENT MOUNT FOR A VEHICLE FRAME

Jesus D. Viduya, Fort Wayne; William G. Pollack, Jr., Auburn; Ronald C. Schroeder, and Scott A. Wooldridge, both of Fort Wayne, all of Ind., assignors to International Truck Intellectual Property Company, L.L.C., Warrenville, Ill.

Provisional application No. 60/138,837, filed on Jun. 10, 1999. This application Jun. 12, 2000, Appl. No. 591,824.

Int. Cl. B62D *21/00*

U.S. Cl. 180—312 **13 Claims**



1. An apparatus for mounting a component to a vehicle frame, comprising: a frame mounting surface attached to said component, said frame mounting surface being oriented generally vertical; a receiver attached to said component, said receiver having a support surface facing generally downward; a component mounting surface attached to said frame, said component mounting surface being oriented generally vertical; a stop support attached to said frame, said stop support having a support surface facing generally upward; wherein said receiver support surface and said stop support surface abut each other, thereby supporting the weight of said component; wherein said frame mounting surface and said component mounting surface are secured against each other when said receiver support surface and said stop support surface abut; wherein said receiver is a slot with an open bottom end, said receiver support surface including a top support surface oriented generally horizontal and side support surfaces angled outward from the top support surface; and wherein said stop support extends from said frame, said stop support surface including a top support surface oriented generally horizontal and side support surfaces angled outward from the top support surface.

US 6,408,975 B1

VARIABLE DISPLACEMENT PUMP WITH ELECTRONIC CONTROL

Leonard F. Bishop, Sterling Hts.; Shawn P. Cap'ser, Monroe, and John D. Dalpiaz, New Boston, all of Mich., assignors to Visteon Global Technologies, Inc., Dearborn, Mich.

Filed Aug. 9, 2000, Appl. No. 634,975

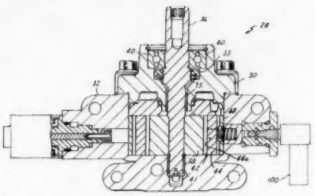
Int. Cl. B62D *5/08*

U.S. Cl. 180—422 **7 Claims**

1. An electronically controlled variable displacement pump system comprising:

a variable displacement pump having a pump body;

a high-pressure fluid chamber disposed within said pump body; and



an electronic relief valve fluidically coupled to said high-pressure fluid chamber that regulates pressure within said high-pressure fluid chamber.

US 6,408,976 B1

TIE ROD MOUNTING STRUCTURE IN CENTER TAKE-OFF TYPE POWER STEERING APPARATUS

Tatsuya Saito, and Satoshi Hamano, both of Tochigi, Japan, assignors to Showa Corporation, Japan

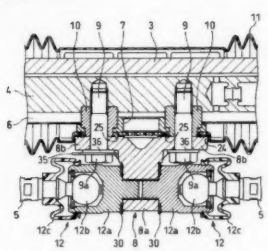
Filed Sep. 27, 2000, Appl. No. 671,420

Claims priority, application Japan, Nov. 25, 1999, 11-333701

This patent is subject to a terminal disclaimer.

Int. Cl. B60D *5/06*

U.S. Cl. 180—428 **20 Claims**



1. A tie rod mounting structure in a center take-off power steering apparatus, comprising:

respective inner ends of a pair of right and left tie rods which are swingably connected to a leg portion of a T-shaped connection member,

both arm portions of said T-shaped connection member being respectively connected to a rack shaft by a bolt extending through a guide shoe sliding within a notch groove formed along a lengthwise direction of a gear box housing,

wherein the respective inner ends of said pair of right and left tie rods laterally move in accordance with a lateral motion of said rack shaft while being guided by said guide shoe.

US 6,408,977 B1

HYDRAULIC STEERING SYSTEM FOR A VEHICLE, ESPECIALLY FOR A MOBILE WORKING MACHINE

Bernd Obertrifter, Steinfeld, and Dieter Roth, Schlüchtern, both of Germany, assignors to Mannesmann Rexroth AG, Lohr/Main, Germany

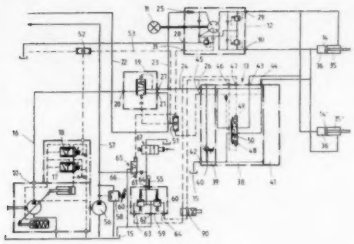
PCT No. PCT/EP99/02531, § 371 Date Oct. 19, 2000, § 102(e) Date Oct. 19, 2000, PCT Pub. No. WO99/55573, PCT Pub. Date Nov. 4, 1999

PCT Filed Apr. 15, 1999, Appl. No. 674,104

Claims priority, application Germany, Apr. 23, 1998, 198 18 111

Int. Cl. B62D *5/06;5/00*

U.S. Cl. 180—442 **22 Claims**



1. A hydraulic steering system for a mobile working machine, with a steering unit (**12**) that can be adjusted out of a neutral position by a first steering member (**11**), which is constructed as a steering wheel, that has a first fluid connection (**29**), which is connected to a ~~(~~left-hand~~)~~ pressure chamber (**35**, **36'**) of a steering motor (**14**, **14'**), said pressure chamber being subjected to pressure for a steering movement to the left, and that has a second fluid connection (**30**), which is connected to a ~~(~~right-hand~~)~~ pressure chamber (**36**, **35'**) of the steering motor (**14**, **14'**), said pressure chamber being subjected to pressure for a steering movement to the right, with a second steering member (**55**), which is constructed as a joystick and by which a pilot-control means (**59**, **71**) can be adjusted and a pilot-control signal can be produced, and with a control valve (**13**) that has an axially movable valve spool (**50**) and can be activated only by the pilot-control signal and has another first fluid connection (**43**), which is connected to the left-hand pressure chamber (**35**, **36'**) of the steering motor (**14**, **14'**), and another second fluid connection (**44**), which is connected to the right-hand pressure chamber (**36**, **35'**) of the steering motor (**14**, **14'**), wherein the control valve (**13**) can only be activated when the steering unit (**12**) is in the neutral position.

US 6,408,978 B1

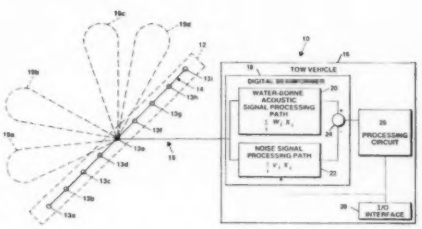
NON-ACOUSTIC SELF NOISE CANCELLER FOR SENSOR ARRAYS

Vincent E. Premus, Pepperell, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 15, 2000, Appl. No. 662,986

Int. Cl. G01V *1/04;1/38*

U.S. Cl. 181—120 **20 Claims**



1. A device for canceling non-acoustic self-noise in a towed sensor array comprising:

an acoustic signal-processing path having an input coupled to said sensor array, said acoustic signal-processing path adapted to detect signals having a first predetermined phase speed;

a noise signal processing path coupled to said sensor array, said noise signal processing path adapted to detect signals having a phase speed which is different than the first predetermined phase speed such that said noise signal processing path isolates vibrational noise from the sensor array;

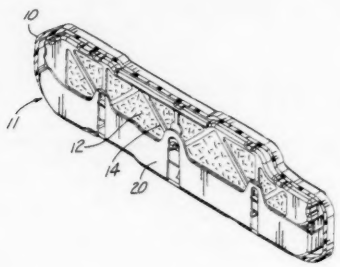
a combiner circuit having a first input coupled to an output of said acoustic signal-processing path and having a second input coupled to an output of said noise signal-processing path, said combiner circuit for combining an output signal of the noise signal processing path with an output signal of the acoustic signal processing path.

US 6,408,979 B1

NOISE ABATEMENT FILTER FOR FUEL TANKS

Larry D. Forbes, 5017 Twana Dr., Des Moines, Iowa 50310; Timothy B. Brandt, 1604 S. 42nd St., West Des Moines, Iowa 50265, and Brian S. Wood, 501 SW. Bell Ave., Des Moines, Iowa 50315

Filed Mar. 15, 2000, Appl. No. 525,365
Int. Cl. G10K *11/00;* **B65D** *25/00*
U.S. Cl. 181—198 **11 Claims**



1. Apparatus comprising:

a fuel tank having a top, bottom, a first side, a second side, a first end and a second end and having an opening in the top thereof;

a sound absorbing baffle having a length, a width and a height and being constructed of a material to allow liquid fuel to flow there through; and

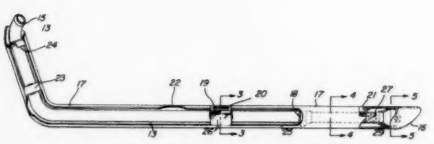
means associated with said baffle for permitting the height of said baffle to be temporarily reduced so that said baffle will pass through said opening in the top of the tank and allow said baffle to substantially extend from the top to the bottom of said tank once it is in the tank.

US 6,408,980 B1

EXHAUST PIPE AND MUFFLER FOR MOTORCYCLE THAT DOES NOT HEAT DISCOLOR

Mark W. Dooley, 6374 E. Paseo Celeste, Anaheim Hills, Calif. 92807

Filed Mar. 2, 2000, Appl. No. 516,843
Int. Cl. F01N *7/08;* **B60K** *13/04*
U.S. Cl. 181—228 **20 Claims**



1. A decorative exhaust pipe for conveying hot exhaust gases, comprising:

a continuous one-piece interior exhaust pipe having a first end and a second end;

a mounting flange fastened to the first end of the interior exhaust pipe for mounting to an exhaust generating source;

a muffler core fastened to the second end of the interior exhaust pipe; and

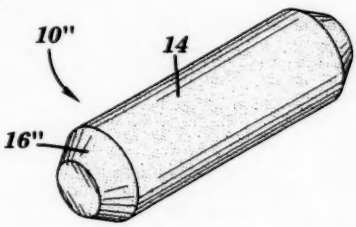
a continuous exterior pipe having a first end and a second end sized to contain the interior exhaust pipe and the muffler core attached thereto in a spaced apart relation, the back side of the exterior pipe having an aperture running along a portion of its length.

US 6,408,981 B1

EXTRUDED MONOLITHIC FOAM EARPLUG

James C. Smith, Granville, and Gary L. Wood, North Granville, both of N.Y., assignors to Saint-Gobain Performance Plastics Corporation, Wayne, N.J.

Filed Sep. 27, 2000, Appl. No. 670,678
Int. Cl. A61B *7/02*
U.S. Cl. 181—315 **26 Claims**



1. A method of fabricating an earplug, comprising the steps of:

a) using an extruder having a die to extrude a monolithic body of foamed elastomeric thermoplastic material about 10 to 20 millimeters in diameter; and

b) at least partially cutting the body into discrete pieces about 10–35 millimeters in length to form individual earplugs;

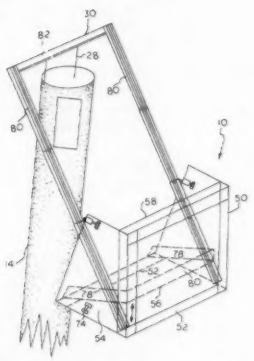
wherein the monolithic body has a density within a range of about 2 to 20 pcf (32 to 320 kg/m^3).

US 6,408,982 B2

EMERGENCY PASSENGER EVACUATION CHUTE AND CHUTE/SLIDE COMBINATION FOR AIRCRAFT

David Lawrence Bockhold, 1090 West 21st Sreet, North Vancouver, British Columbia, Canada, V7P 2C5

Filed Dec. 1, 2000, Appl. No. 726,439
Claims priority, application Canada, Dec. 7, 1999, 2292024
Int. Cl. A62B *1/20;* **B64C** *1/22*
U.S. Cl. 182—48 **25 Claims**



1. An aircraft emergency passenger evacuation chute arrangement for discharging passengers from a hatch of an aircraft, comprising:

an elongate flexible tubular chute for conveying descending passengers;

a carrier structure for stowing said chute within a folded or bunched stowage position;

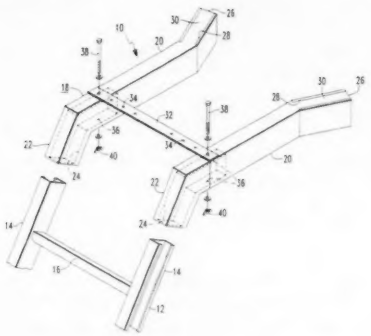
a chute suspension frame associated with said carrier structure and engaged to an upper end of said chute, said frame being moveable between a stowed position substantially adjacent to or enclosed within said carrier structure and a deployment position wherein said frame extends outwardly away from

said carrier structure to displace a portion of said frame outwardly from said aircraft for the suspension of said chute from said portion in a generally vertical position;

means for removing said chute from said carrier structure; and

means for displacing said carrier structure from a stowage position inboard of said aircraft and spaced apart from said hatch, to a deployment position abutting the shell of said aircraft at said hatch.

US 6,408,983 B1
LADDER STABILIZING DEVICE
Eugene Widurski, 833 Marshall Ave., Pittsburgh, Pa. 15214
Filed Sep. 5, 2000, Appl. No. 655,323
Int. Cl. E06C *7/00*
U.S. Cl. 182—107 **4 Claims**



1. A ladder stabilizing device for attachment to the upper ends of the stiles of a ladder for supporting the ladder against a flat wall surface and the inside and outside corner surfaces of two adjoining wall surfaces of a building structure, the ladder stabilizing device comprising:

a pair of interchangeable, elongated ladder stabilizing support members adapted for removable securement to the respective upper ends of the stiles of the ladder;

each ladder stabilizing support member including a box-shaped socket receiving portion having a stile receiving opening for allowing the upper end of one ladder stile to be slidably received therein, an elongated main body portion having a longitudinal axis with the box-shaped socket receiving portion being integrally joined to the main body portion and the box-shaped socket receiving portion having an angular displacement from the main body portion of approximately 120 degrees, and a wall contacting portion integrally joined to the main body portion opposite the socket receiving portion and which extends outwardly from the main body portion at an angular displacement of approximately 155 degrees with respect to the axis of the main body portion whereupon the wall contacting portion can abut the flat and adjoining wall surfaces so that the main body portion can space the ladder from the wall surfaces of the building structure when the ladder stabilizing members are secured to the upper ends of the ladder stiles thereby supporting the ladder adjacent to the wall surfaces of the building structure;

the socket receiving portion, the main body portion, and the wall contacting portion having a constant rectangular cross-section throughout for providing a continual rectangular cross-section from the stile receiving opening, through the socket receiving portion, along the main body portion, and through the wall contacting portion of the ladder stabilizing support members;

each wall contacting portion and socket receiving portion of each ladder stabilizing support member having an angular displacement from each other in separate planes that are approximately 90 degrees from each other;

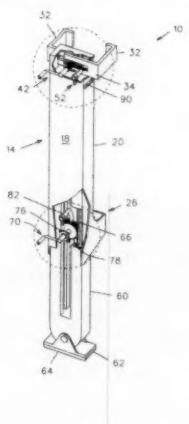
at least two elongated connection bars positioned parallel to one another and having the main body portion of the ladder stabilizing support member positioned therebetween, each of the connection bars having a pair of opposite attachment ends so that each attachment end can be secured to the main body portions of each respective ladder stabilizing support member, each attachment end having a plurality of holes so that the distance between each ladder stabilizing support member can be varied for allowing the selective adjustment of the spatial distance between the ladder stabilizing support members in order to accommodate variously sized ladders and then fixed by the connection bars in order to maintain the ladder stabilizing support members in a fixed parallel relationship with respect to each other when the ladder stabilizing support members are mounted to the upper ends of the ladder stiles;

the ladder stabilizing support members capable of interchangeable securement to the respective upper ends of the ladder stiles so that in one configuration the ladder stabilizing support members can support the ladder adjacent the inside corner surfaces of adjoining wall surfaces and, after interchanging on the upper ends of the ladder stiles, the ladder stabilizing support members can form a second configuration for supporting the ladder adjacent the outside corner surfaces of adjoining wall surfaces;

each of the wall contacting portions of the ladder stabilizing support members having one external contact surface for contacting either the inside or outside corner surface of the building structure, the contact surfaces diverge outward and away from each other when configured to support the ladder adjacent outside corner surfaces of adjoining wall surfaces, the same contact surfaces diverge inward and toward each other when the ladder stabilizing support members are interchanged for configuring the contact surfaces to support the ladder adjacent inside corner surfaces of adjoining wall surfaces, and

the connection bars and the stabilizing support members pivotally connected together and foldable for collapsing the stabilizing support members toward one another for compactly containing the ladder stabilizing device during storage.

US 6,408,984 B1
LADDER LEVELING DEVICE
Craig T. Cavagnaro, P.O. Box 937, 177 Tamarack Woods Dr., Lakeside, Mont. 59922
Filed Mar. 20, 2001, Appl. No. 812,379
Int. Cl. E06C *7/44*
U.S. Cl. 182—205 **2 Claims**



1. A device for leveling a ladder having at least a pair of support legs, comprising:

a ladder support sleeve having a generally rectangular configuration with inner and outer side walls and front and rear walls intermediate said side walls, said support sleeve having a closed top and defining an open bottom;

a platform integrally extending from said inner side wall of said support sleeve, said platform being normal to said inner side wall and adjacent said open bottom, said platform including a front guide wall parallel to said inner side wall and a pair of side guide walls intermediate said front guide wall and said inner side wall, said front and side guide walls adapted to stabilize a foot of a ladder support leg upon said platform;

first and second opposed U-shaped clamp arms coupled to said support sleeve adjacent said closed top and adapted to receive said ladder support leg therebetween, said clamp arms adapted to move concurrently in opposed frontward and backward directions relative to said front and rear walls of said support sleeve;

wherein each clamp arm includes an inner layer constructed of neoprene material adapted to frictionally grip said support leg of a ladder;

a first rack gear integrally attached to said first clamp arm and having a plurality of teeth;

a first crank handle having a shaft rotatably coupled to said support sleeve and extending normally across said first rack gear;

a first pinion gear fixedly mounted to said first crank handle shaft and having a plurality of teeth positioned for engagement with said first rack teeth, whereby said first clamp arm is moved in a linear direction upon a corresponding rotation of said first crank handle;

means for maintaining said first pinion gear at a user-selectable position relative to said first rack gear;

a sight level mounted to said support sleeve;

a leveler leg coupled to said support sleeve for movement in first and second opposed directions within said support sleeve;

means for vertically adjusting said leveler leg relative to said support sleeve, said adjusting means comprising:

a second rack gear vertically mounted within said leveler leg, said second rack gear having a plurality of teeth;

a second crank handle having a shaft extending through said outer side wall of said support sleeve and being rotatably coupled to said outer side wall thereof;

a second pinion gear fixedly mounted to said second crank handle shaft and having a plurality of teeth, said second pinion gear being positioned such that said second pinion gear teeth engage said second rack gear teeth for translating rotation of said second crank handle into respective vertical movement of said leveler leg relative to said support sleeve;

means for maintaining said second pinion gear at a user-selectable position relative to said second rack gear;

a foot pivotally connected to a distal end of said leveler leg relative to said support sleeve; and

a resilient pad attached to a bottom surface of said foot.

US 6,408,985 B1

MOTOR DRIVEN LUBRICATOR

Anton Orlitzky, 343 Rose Wynd, Delta, British Columbia, Canada, V4M 3L8, and Helmut Fandrich, 2461 Sunnyside Place, Clearbrook, British Columbia, Canada, V2T 4C4

Continuation-in-part of application No. 08/091,776, filed on Jul. 14, 1993, now abandoned, which is a continuation of application No. 07/919,173, filed on Jul. 23, 1992, now abandoned. This application Jul. 18, 1994, Appl. No. 278,116.

This patent is subject to a terminal disclaimer.

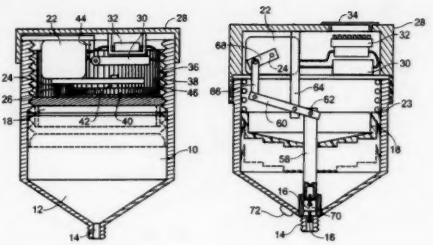
Int. Cl. F16N *11/08*

U.S. Cl. 184—37 **3 Claims**

1. A lubricating apparatus comprising:

a housing defining a main lubricant chamber to receive a lubricant and having an outlet for lubricant;

a central shaft disposed longitudinally within said chamber;



a movable member tightly fitted within an inner surface of said main lubricant chamber, slidably mounted on said central shaft, and being movable towards said outlet to drive lubricant from the main chamber through said outlet by means of positive pressure on said lubricant by said movable member;

a motor having a drive shaft;

a fulcrum having opposite ends, and being attached at its proximal end to said housing;

drive means comprising a system of levers attached to said fulcrum and said movable member, and being driven by said motor;

electronic control means for controlling activation of said motor in accordance with a predetermined program.

US 6,408,986 B1

CHARGER FOR ELEVATOR CALL DEVICES

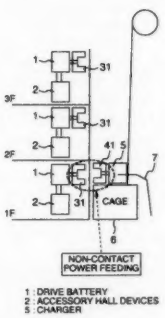
Hideki Ayano, Hitachi; Hiromi Inaba, Hitachinaka; Sadao Hokari, Hitachinaka, and Atsuya Fujino, Hitachinaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 2001, Appl. No. 791,714

Claims priority, application Japan, Aug. 29, 2000, 2000-259644

Int. Cl. B66B *1/06*

U.S. Cl. 187—290 **17 Claims**



1. An elevator comprising:

a cage for moving up and down through a shaft;

a plurality of groups of accessory hall devices each group provided near the elevator in an elevator hall formed on a respective one of floors of a building;

a plurality of drive batteries each provided in a respective one of the halls for providing electric power to the plurality of groups of accessory hall devices provided in the hall;

a charging device provided on said cage for charging each of said plurality of drive batteries.

US 6,408,987 B2

ELEVATOR GUIDANCE DEVICE

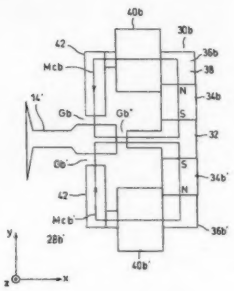
Mimpei Morishita, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 15, 2001, Appl. No. 812,787

Claims priority, application Japan, Mar. 16, 2000, 2000-073406

Int. Cl. B66B *1/34*

U.S. Cl. 187—292 **9 Claims**



1. An elevator guidance device, comprising:

a guide rail installed in a vertical direction;

a moveable body capable of being raised and lowered along said guide rail;

an electromagnet mounted on said moveable body and including a plurality of magnetic poles that face said guide rails with a gap therebetween and which is arranged so that attractive forces that act on said guide rails at at least two of said plurality of magnetic poles are in mutually opposite directions;

a plurality of magnetic units including a permanent magnet that supplies magnetomotive force needed for guidance of said moveable body and that is arranged so as to share a magnetic path with said electromagnets in said gap;

sensors configured to detect a condition in said gap of a magnetic circuit formed by said electromagnets with said gap and said guide rail;

a guidance control unit controlling an exciting current of said electromagnets in accordance with the output of said sensors and thereby stabilizing said magnetic circuits;

a zero power control unit stabilizing said magnetic circuits in a condition wherein an exciting current of said electromagnets is zero, based on an output of said sensors; and

an output limiting unit setting a prescribed saturation value for an output of said zero power control unit and if said output of said zero power control unit exceeds a range defined by said saturation value, and making said saturation value said output of said zero power control unit.

US 6,408,988 B2

DISPLAY DEVICE HAVING MULTI SEGMENT DISPLAY WITH COMMON SEGMENTS

Robert Hani, Unterlunkhofen; Lukas Barmet, Lucerne, and Hanspeter Keiser, Stansstad, all of Switzerland, assignors to Inventio AG, Hergiswil NW, Switzerland

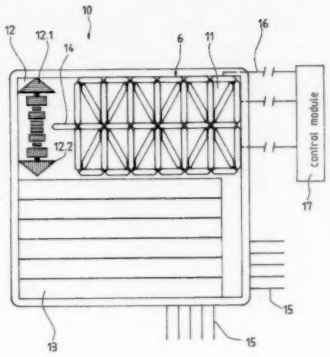
Filed Nov. 30, 2000, Appl. No. 727,977

Claims priority, application European Pat. Off., Dec. 3, 1999, 99811113

Int. Cl. B66B *3/00*

U.S. Cl. 187—391 **7 Claims**

1. A display device comprising a multi-segment display for representing varying multiple character information in elevator installations, the multi-segment display comprising at least two character display elements each having a plurality of segments, each character display element capable of independently and simultaneously with another of the display elements displaying a character of a multiple character display, characterized in that adjacently positioned character display elements have at least one common segment in the plurality of segments in both of the two character display elements, whereby a character displayed may be formed either by the segments of a single character display element or the segments of two adjacent character display elements including at least one common segment.



US 6,408,989 B2

VEHICLE BRAKE SYSTEM HAVING A SENSOR TO MEASURE MOVEMENT

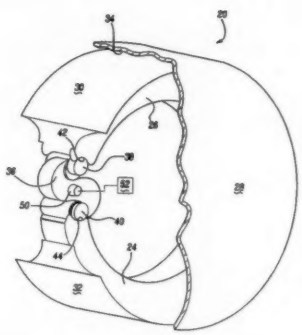
Dennis A. Kramer, Troy, Mich., assignor to Meritor Heavy Vehicle Systems, LLC, Troy, Mich.

Continuation of application No. 09/185,481, filed on Nov. 3, 1998, now Pat. No. 6,273,218. This application Jul. 31, 2001, Appl. No. 919,315.

This patent is subject to a terminal disclaimer.

Int. Cl. F16D *66/00*

U.S. Cl. 188—1.11 R **18 Claims**



1. A vehicle brake system, comprising:

a drum;

a brake shoe having an engagement surface for selectively engaging an inner surface on the drum;

a cam member supported for selective rotary movement;

a roller interposed between the brake shoe and the cam member and engaging the cam member and moving responsive to rotary movement of the cam member; and

a sensor that detects an amount of movement of said cam member or said roller during a braking application and provides a signal responsive to any amount of movement of the cam member, the signal having a signal characteristic that changes responsive to the cam movement such that the signal is indicative of the amount of movement.

US 6,408,990 B1

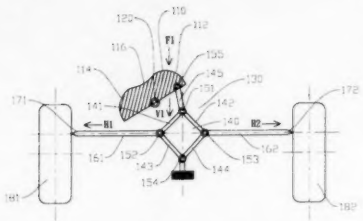
SETTLING DEVICE FOR STOPPING MOVEMENT OF BABY CAR BY INHIBITING ROTATION OF WHEELS

Chin-Ching Chen, Hsin-Chu Industrial Park, Taiwan, assignor to Kingstar Baby Carriage Co., Ltd., Taiwan

Filed Dec. 20, 2000, Appl. No. 739,669

Int. Cl. B62B *9/08*

U.S. Cl. 188—20 **15 Claims**



1. A settling device for stopping a baby car from moving by inhibiting the rotation of wheels, comprising:

a button portion;

a button support portion arranged between two opposite ends of said button portion for supporting said button portion, and allowing one of said two opposite ends to be elevated when the other is pressed down;

a pivot portion, comprising:

a first linking rod connected to a first end of said button portion via a first connecting point, and performing a first horizontal shift when said first end is pressed down; and

a first arm connected to said first linking rod via a second connecting point, and performing a second horizontal shift to enter one of said wheels in response to said first horizontal shift of said first linking rod so as to inhibit said wheel to rotate.

US 6,408,991 B1

PARTIAL-LINING DISK BRAKE IN THE FORM OF A FIXED-CALIPER BRAKE

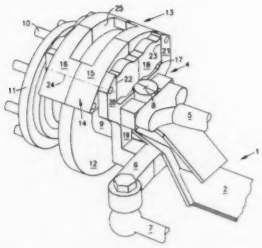
Rainer Herffurth, Fuldatal, and Uwe Mierisch, Baunatal, both of Germany, assignors to DaimlerChrysler AG, Stuttgart, Germany

Filed Dec. 1, 1999, Appl. No. 452,305

Claims priority, application Germany, Dec. 1, 1998, 198 55 275

Int. Cl. F16D *55/00*

U.S. Cl. 188—71.1 **16 Claims**



1. A partial-lining disk brake in the form of a fixed-caliper brake for wheels of vehicles that are rotatable about an axle spindle, having a brake housing carrier stationary with respect to the axle spindle and a brake housing split parallel to the brake disk plane whose housing halves are detachably braced with respect to one another and to the brake housing carrier, the brake housing carrier having a recess that receives, as counterelement, a segment of the brake housing,

wherein the recess is configured as a receptacle, open radially outward at the edge, having positive engagement in the wheel rotation direction with the segment of the brake housing forming the counterelement.

US 6,408,992 B1

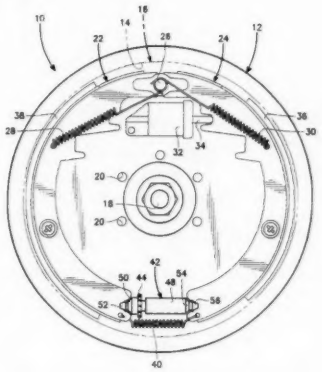
STAINLESS STEEL BRAKE STAR ADJUSTER

Larry E. Wilkin, 305 Ulysses St., Simi Valley, Calif. 93065

Filed Jun. 1, 2001, Appl. No. 870,761

Int. Cl. F16D *51/00*

U.S. Cl. 188—79.51 **9 Claims**



1. An adjuster for establishing the non-braking position of a vehicular brake pad assembly comprising:

a sleeve having an internal chamber, said internal chamber including a series of female screw threads, said internal chamber having an entry opening, said sleeve having a first outer end, said first outer end adapted to connect with a first brake pad unit of said brake pad assembly;

a shaft having male screw threads which is to be located within said internal chamber with said male screw threads engaging with said female screw threads, said shaft having a second outer end located exteriorly of said internal chamber, said second outer end adapted to connect with a second brake pad unit of said brake pad assembly;

a star wheel secured to said second outer end, said star wheel being manually connectable to affect turning of said shaft relative to said sleeve with said male screw threads moving relative to said female screw threads;

a seal located within said internal chamber establishing a water-tight and dust tight connection between said shaft and said seal preventing water and dust from entering said internal chamber; and

said sleeve having a non-threaded area adjoining said female screw threads, said non-threaded area being almost of equal length to the length of said female screw threads, whereby said male screw threads of said shaft can be freely telescopingly moved through said non-threaded area prior to encountering engagement with said female screw threads.

US 6,408,993 B1

CONTROL ARRANGEMENT FOR A BRAKE LEVER

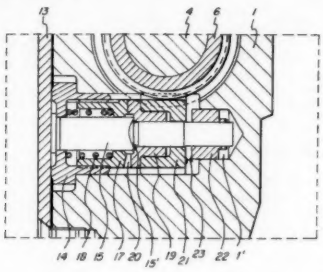
Jaan Truuvert, Kävlinge, Sweden, assignor to Haldex Brake Products AB, Sweden

Continuation of application No. PCT/SE99/00497, filed on Mar. 29, 1999. This application Sep. 27, 2000, Appl. No. 671,370.

Claims priority, application Sweden, Mar. 27, 1998, 9801052

Int. Cl. F16D *65/60*

U.S. Cl. 188—79.55 **6 Claims**



1. A brake lever for attachment to a splined S-cam shaft of an automotive drum brake and connection to a brake cylinder push rod, including a worm wheel, rotatably mounted in a housing of the brake lever and having internal splines for cooperation with S-cam shaft, and a worm screw, rotatable in the housing perpendicularly to the worm wheel and meshing therewith, and a control arrangement for transmitting a control movement from a reference point to a clutch wheel, which is rotatable on the worm screw, depending on the angular movement of the brake lever, and which forms a clutch with the worm screw normally held engaged by a strong compression spring, the control arrangement including a control disc, which is rotatable coaxially with the worm wheel and is connected to a control ring having a control arm for establishing the point reference by being attached to a fixed part of a vehicle chassis, a pinion meshing with the toothed periphery of the control disc and an adjustment screw, which is coaxial with the pinion and is in toothed engagement with the clutch wheel, wherein the axis of the worm screw is perpendicular to the axis of the pinion and the adjuster screw, characterized in that a cylindrical driver is axially but non-rotatably movable in relation to the pinion coaxial therewith and forms a one-way clutch with a unit including the adjustment screw, which is axially movable a distance corresponding to a control distance for the brake lever, the one-way clutch being spring-biassed into engagement.

US 6,408,994 B1

DRUM BRAKE

Toshifumi Maehara, Tokyo, Japan, assignor to Akebon O Brake Industry Co., Ltd., Tokyo, Japan

Filed Jan. 2, 2002, Appl. No. 32,487

Claims priority, application Japan, Jan. 4, 2001, 2001-000186

Int. Cl. F16D *65/34*

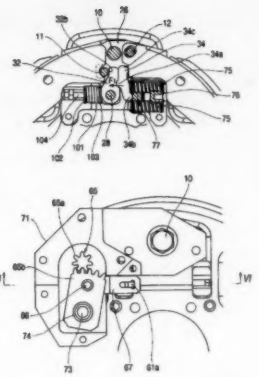
U.S. Cl. 188—156 **8 Claims**

1. A drum brake comprising:

a pair of brake shoes opposedly arranged inside a drum;

an operating force producing mechanism for driving a power lever constituting an output portion of a shoe operating force by an electric motor;

link mechanism, for driving said brake shoes, including an input lever for receiving the shoe operating force outputted from said power lever, wherein said link mechanism presses said brake shoes to a drum and operates a brake restricting force to said input lever in a direction of a reducing operation of the shoe operating force in accordance with a brake force operated from said brake shoes to an anchor portion for controlling a press force of said brake shoes to said drum;



a damper spring between said power lever and said input lever, for transmitting the shoe operating force outputted from said power lever to said input lever and for absorbing an impact force transmitted from said brake shoes to said power lever via said link mechanism in braking.

US 6,408,995 B2

METHOD FOR FLUSHING THE CASING OF A HYDRAULIC MOTOR

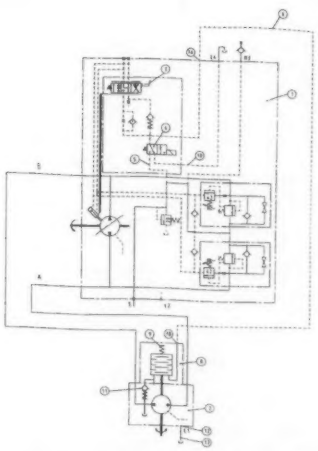
Axel Widemann, Neumunster, Germany, assignor to Sauer-Danfoss Inc., Ames, Iowa

Filed Feb. 5, 2001, Appl. No. 777,041

Claims priority, application Germany, Apr. 11, 2000, 100 17 844

Int. Cl. F16D *65/78*

U.S. Cl. 188—264 F **10 Claims**



1. A method for flushing the casing of a hydraulic motor with hydraulic fluid, comprising,

taking a hydraulic motor having a casing and being driven by a first hydraulic fluid which flows through the casing,

flushing the casing with an additional flow of supplemental hydraulic fluid having a temperature lower than the temperature of the first hydraulic fluid,

wherein the supplemental hydraulic fluid simultaneously acts on a braking device through a brake line of the hydraulic motor to cancel any braking action.

US 6,408,996 B1

BOTTOM PLATE ASSEMBLY FOR WHEELED LUGGAGE

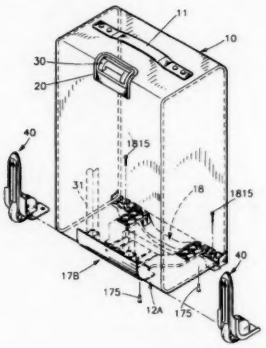
Jer Hong Lin, Taipei, Taiwan, assignor to Chaw Khong Technology Co., Ltd., Taiwan

Filed Sep. 14, 2000, Appl. No. 661,951

Claims priority, application Taiwan, Jan. 25, 2000, 089201262

Int. Cl. A45C *5/00*

U.S. Cl. 190—18 R **3 Claims**



2. A bottom plate assembly/luggage combination (**12**) of wheeled luggage with a bottom having a width defined by a rear bottom edge and a front bottom edge, and a length defined by two front bottom corners on opposite sides of the front bottom edge, the wheeled luggage including a handle assembly (**30**) on a top section of the wheeled luggage and at least two wheels mounted on the rear bottom edge, said bottom plate assembly/luggage combination comprising:

a support member (**17**) for supporting at least a portion of the bottom of the wheeled luggage;

a foot sub-assembly (**18**), releasably secured to the support member (**17**), and

two foot members (**181**) positioned on opposite ends of the foot sub-assembly (**18**) for securing the foot sub-assembly (**18**) to the bottom near the front bottom edge of the wheeled luggage, wherein the foot sub-assembly (**18**) includes a middle section disposed between the front bottom edge and the rear bottom edge and having an arcuate section spaced from the bottom of the wheeled luggage so that the middle section can be used as a bottom handle.

US 6,408,997 B1

STRUCTURE FOR EXPANDING HOLDING CAPACITY OF LUGGAGE

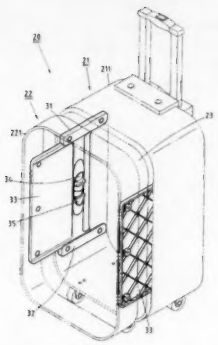
Shou-Mao Chen, 344, Sec.1, Chung Shan Rd., Ta-Cha Township, Taichung Hsien, Taiwan

Filed Feb. 21, 2001, Appl. No. 789,088

Int. Cl. A65C *7/00*

U.S. Cl. 190—103 **2 Claims**

1. A luggage comprising a main body, a cover body, and an expansion portion connecting the main body and the cover body; wherein said main body has a frame which is provided in opposite inner sides with an expansion structure comprising two slide rails, an expansion board, an upper retaining rod, a lower retaining rod, a spring, and a locating board, said expansion board being provided in an inner side with a longitudinal slot hole which is in turn provided with a side hole, said upper retaining rod and said lower retaining rod being provided respectively with a protruded piece, a long hole, and a retaining seat for retaining said spring, said upper retaining rod and said lower retaining rod further provided respectively with a toothed portion extending beyond an upper end and a lower end of said expansion board such that said two protruded



pieces extend beyond an outer side of said expansion board, said locating board being provided with two protruded pillars opposite to each other such that said two protruded pillars are retained in two tubular retainers of said expansion board via said long holes of said two retaining rods, said two retaining rods being forced by said spring to move up and down for an appropriate distance, said two slide rails being fastened to an inner side of said frame of said main body and provided with a rack, said racks of said two slide rails being engageable and disengageable with said two toothed portions of said two retaining rods, said expansion board having an outer side edge fastened with an inner side edge of a frame of said cover body by a plurality of rivets, said expansion board being moved along said two slide rails.

US 6,408,998 B1

DEVICE AND METHOD FOR SUPPLYING POWER TO A VEHICLE, SEMI-CONDUCTOR CIRCUIT DEVICE FOR USE IN THE SAME AND COLLECTIVE WIRING DEVICE FOR A VEHICLE OR AN AUTOMOBILE

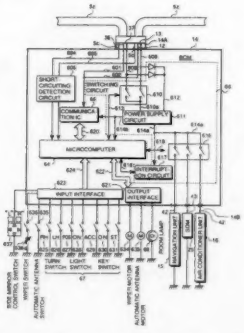
Hiroyuki Saito, Hitachinaka; Tatsuya Yoshida, Urizura-machi; Shinichi Sakamoto, Mito; Mitsuru Koni, Hitachinaka, and Kiyoshi Horibe, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Car Engineering Co., Ltd., Hitachinaka, both of Japan

Division of application No. 09/504,116, filed on Feb. 15, 2000, which is a division of application No. 08/894,285, filed as application No. PCT/JP96/00386, filed on Feb. 21, 1996, now Pat. No. 6,182,807. This application Apr. 24, 2001, Appl. No. 840,064.

Claims priority, application Japan, Feb. 21, 1995, 7-32647; Sep. 5, 1995, 7-228238

Int. Cl. B60L *9/00*

U.S. Cl. 191—2 **6 Claims**



2. An intensive wiring apparatus for an automobile having an air bag system, comprising:

A. an air bag controller for driving an air bag inflator in response to an output of a collision sensor;

B. a display controller for displaying a working state of said air bag system on an instrument panel;

C. a communication line for connecting said air bag controller and said display controller to each other; and

D. a communication control apparatus for transmitting an air bag operation signal from said air bag controller to said display controller via said communication line; and wherein

E. said air bag controller receives power supplied from said communication control apparatus.

US 6,408,999 B2

HYDROKINETIC TORQUE CONVERTER AND LOCKUP CLUTCH THEREFOR

Dieter Otto, Achern-Oberachern, and Volker Middlemann, Bühl-Altschweier, both of Germany, assignors to Luk Getriebe-Systeme GmbH, Buhl/Baden, Germany

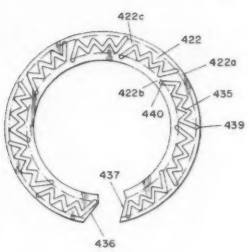
Continuation of application No. 09/545,452, filed on Apr. 7, 2000, now Pat. No. 6,273,228, which is a division of application No. 08/978,389, filed on Nov. 25, 1997, now Pat. No. 6,062,358, which is a division of application No. 08/272,920, filed on Jul. 8, 1994, now abandoned. This application Jul. 3, 2001, Appl. No. 898,251.

Claims priority, application Germany, Jul. 9, 1993, 43 22 974; May 25, 1994, 44 18 024

This patent is subject to a terminal disclaimer.

Int. Cl. F16H *45/02*

U.S. Cl. 192—3.29 **39 Claims**



1. A friction clutch for a hydrokinetic torque converter, said clutch having at least one pair of annular interfaces that are adapted to engage while rotating in one direction and continuously slipping relative to each other to effect torque transmission in bypass relationship to torque transmitted by hydraulic fluid in said converter, one of said interfaces having a prescribed width and at least one circuitous groove, said groove extending a substantial annular distance about said one interface and adapted to direct hydraulic fluid in said torque converter from a high pressure cavity at one outer edge of said one interface and across the width of said one interface in a circuitous path in at least three traversing passes to a low pressure cavity at an inner edge of said one interface, each of said passes extending substantially the entire width of said one interface, said groove having an inlet section that defines one of said passes and has inlet that is adapted to open said groove at said outer edge of said one interface to said high pressure cavity, and said groove having an outlet section that defines another if said passes and has an outlet that is adapted to open said groove at said inner edge of said one interface to said low pressure cavity at an angular location remote from said inlet.

US 6,409,000 B1

TWO-WAY CLUTCH AND ROTATION TRANSMISSION DEVICE

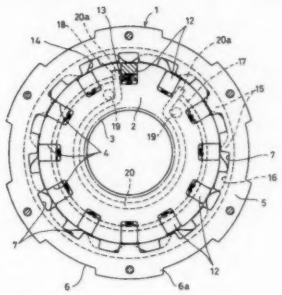
Kenichiro Itoh, and Isao Hori, both of Shizuoka, Japan, assignors to NTN Corporation, Osaka, Japan

Filed Jun. 2, 2000, Appl. No. 585,618

Claims priority, application Japan, Jun. 3, 1999, 11-156781; Jun. 4, 1999, 11-157665; Sep. 8, 1999, 11-254281

Int. Cl. B60K *17/02;23/08;* **F16D** *27/05*

U.S. Cl. 192—39 **66 Claims**



1. A two-way clutch comprising:

a first rotary member having a first annular surface with first pockets therein;

a second rotary member that is rotatable relative to said first rotary member, said second rotary member having a second annular surface with second pockets therein, with said second annular surface opposing said first annular surface;

block members, each of said block members received within a corresponding said first pocket;

resilient members, each of said resilient members received within a corresponding said first pocket to bias a corresponding said block member in a direction from said first annular surface toward said second annular surface and into a corresponding said second pocket; and

a cam ring having a third annular surface with cam lobes extending therefrom, said third annular surface opposing said first annular surface with said cam lobes being equal in number to that of said block members, said cam ring being rotatable relative to said first rotary member between a first position at which said cam lobes are aligned with said block members to force said block members out of corresponding said second pockets and into corresponding said first pockets against said resilient members, respectively, and a second position at which said cam lobes are not aligned with said block members to allow said resilient members to bias said block members to extend from corresponding said first pockets into corresponding said second pockets, respectively.

US 6,409,001 B1

FULL-COMPLEMENT MULTI-DIRECTIONAL COUPLING

John Hugh Kerr, Kingston, Canada, assignor to Ker-Train Holdings LTD, Kingston, Canada

PCT No. PCT/CA99/01072, § 371 Date Jul. 13, 2000, § 102(e) Date Jul. 13, 2000, PCT Pub. No. WO99/28645, PCT Pub. Date Jun. 10, 1999

Provisional application No. 60/066,666, filed on Nov. 26, 1997. This PCT application Nov. 26, 1998, Appl. No. 554,229.

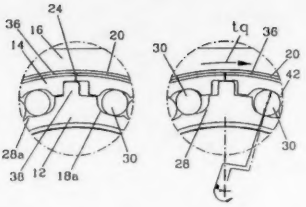
Int. Cl. F16D *15/00*

U.S. Cl. 192—44 **22 Claims**

1. A coupling comprising:

a first coupling member including a first friction surface;

a second coupling member including a first bearing surface, and a first recess provided within the first bearing surface;



a tubular slipper disposed between the first and second coupling members, the slipper including a second friction surface for engaging with the first friction surface, and a second bearing surface coaxial to the first bearing surface, the first and second bearing surfaces defining a channel therebetween for receiving a plurality of roller elements therein, the second bearing surface including a second recess, the first and second recesses together defining a pocket opening into the channel for retaining one of the roller elements therein, the pocket being configured for coupling the first coupling member to the second coupling member as the slipper and the second coupling member rotate relative to one another, and the first recess comprises a first arched recess and the second recess comprises a second arched recess complementary in shape to the first arched recess and disposed substantially opposite to the first arched recess.

a pressure plate operatively arranged in said housing so that said pressure plate is rotatable with said housing about the axis of rotation and is axially displaceable relative to said housing; and

a force accumulator for generating a pressure force between said pressure plate and said housing, said force accumulator being supported on said housing and on said pressure plate wherein said force accumulator is arranged outside said housing, wherein a radially outward extent of said force accumulator corresponds approximately to a radially outward extent of said housing.

21. A method for assembling a friction clutch having a pressure plate subassembly and an abutment arrangement including a flywheel mass arrangement, wherein the pressure plate subassembly is connected to the abutment arrangement for joint rotation about an axis of rotation, said pressure plate subassembly comprising a housing connectable to the abutment arrangement of the friction clutch for joint rotation about an axis of rotation, a pressure plate operatively arranged in the housing so that the pressure plate is rotatable with said housing about the axis of rotation and is axially displaceable relative to the housing, and a force accumulator for generating a pressure force between the pressure plate and the housing, the force accumulator being supported on the housing and on the pressure plate wherein said force accumulator is arranged outside the housing, said method comprising the steps:

(a) attaching the housing and the pressure plate of the pressure plate subassembly to the abutment arrangement; and

(b) attaching the force accumulator to the housing of the pressure plate subassembly after said step (a).

US 6,409,002 B1

PRESSURE PLATE SUBASSEMBLY

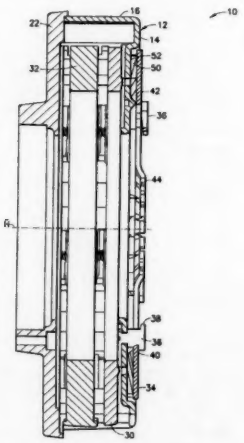
Andreas Orlamünder; Achim Link, both of Schweinfurt; Wolfgang Reiber, Sennfeld, and Sebastian Vogt, Bad Neustadt, all of Germany, assignors to Mannesmann Sachs AG, Schweinfurt, Germany

Filed Jun. 23, 2000, Appl. No. 602,804

Claims priority, application Germany, Jun. 23, 1999, 199 28 710; May 23, 2000, 100 25 533

Int. Cl. F16D *13/56;13/71*

U.S. Cl. 192—70.17 **24 Claims**



20. A pressure plate subassembly for arrangement in a friction clutch having an abutment arrangement and at least one clutch disk with friction linings, said pressure plate subassembly comprising:

a housing rotatable about an axis of rotation and connectable to the abutment arrangement of the friction clutch for joint rotation about the axis of rotation;

US 6,409,003 B2

CLUTCH CONTROL APPARATUS

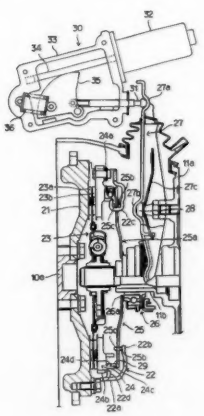
Takao Naito, Nagoya; Naoyuki Maki, Kariya; Tomomitsu Terakawa, Anjyo, and Tetsuya Kohno, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 18, 2000, Appl. No. 738,322

Claims priority, application Japan, Dec. 24, 1999, 11-367050

Int. Cl. F16D *13/75*

U.S. Cl. 192—70.25 **12 Claims**



1. A clutch control apparatus for a vehicle, comprising:

a clutch disk disposed opposite a flywheel which rotates unitarily with an output shaft of a drive unit;

a pressure plate for applying a press-contact load to said clutch disk so as to press said clutch disk toward said flywheel to thereby engage said clutch disk with said flywheel;

a diaphragm spring for causing said pressure plate to generate the press-contact load;

an actuator for generating and applying a force to a predetermined portion of said diaphragm spring by moving a member to deform said diaphragm spring for disengaging said clutch disk from said flywheel according to driving conditions of the vehicle;

said clutch control apparatus further comprising

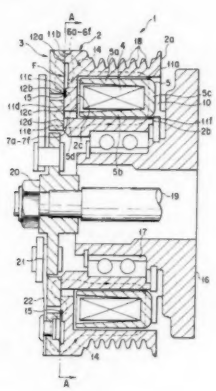
press-contact load adjustment means for modifying the press-contact load by modifying a posture of said diaphragm spring as observed when said clutch disk is engaged with said flywheel, according to an instruction;

stroke estimation means for estimating a stroke of said member on the basis of a calculated ideal reaction force to be imposed on said member through said diaphragm spring and an estimated force generated by said actuator;

stroke detection means for detecting an actual stroke of said member; and

adjustment instruction means for providing said press-contact load adjustment means with said instruction such that the detected stroke becomes equal to the estimated stroke to thereby make adjustment.

US 6,409,004 B1
ELECTROMAGNETIC CLUTCH
Minoru Kawada, and Ryuhei Tanigaki, both of Nishi-biwajima-machi, Japan, assignors to Mitsubishi Heavy Industries, Ltd., Tokyo, Japan
Filed Aug. 9, 2000, Appl. No. 635,092
Claims priority, application Japan, Jan. 14, 2000, 2000-006577
Int. Cl. F16D *27/112*
U.S. Cl. 192—84.961 **6 Claims**



1. An electromagnetic clutch comprising:

a clutch rotor having a flange portion;

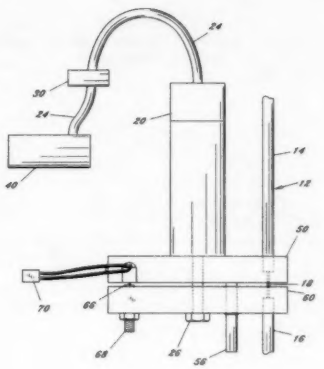
an armature opposed to the flange portion; and

an exciting coil held in the clutch rotor and adapted to form in the clutch rotor and the armature a magnetic flux for attaching the armature to the flange portion when supplied with current,

the flange portion including arcuate outside slits and arcuate inside slits, formed individually on the respective circumferences of a plurality of concentric circles, and a plurality of magnetic pole portions defined in the radial direction of the flange portion by the outside slits and the inside slits,

the flange portion having a step portion and a concave surface continuous with the step portion, formed in a region corresponding to a specific one of the magnetic pole portions formed between the outside slits and the inside slits so as to be situated more remote from the armature than the other magnetic pole portions, the step portion serving to restrain the specific magnetic pole portion from touching the armature when the magnetic flux is formed.

US 6,409,005 B1
CLUTCH CONTROL SYSTEM
Michael L. Heston, 7 Arnold Dr., Mansfield, Ohio 44906
Filed Aug. 3, 2000, Appl. No. 630,954
Int. Cl. F16D *25/08*
U.S. Cl. 192—85 C **11 Claims**



1. A clutch control system for allowing a motorcycle rider to engage a clutch with both hands firmly grasping the handlebars, comprising:

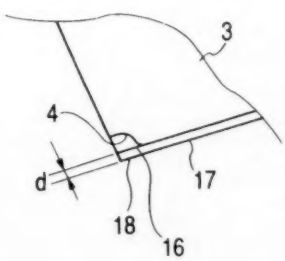
an air cylinder having an actuator shaft, wherein said air cylinder is fluidly connected to a pressurized air source;

a first member attached to said air cylinder formed for receiving a first sheath of a clutch cable;

a second member attached to a distal end of said actuator shaft formed for receiving a second sheath of said clutch cable; and

a means for controlling said air cylinder for selectively extending said actuator shaft.

US 6,409,006 B1
FRICTION PLATE
Tetsuya Wakamori, Iwata, and Rikiya Takahashi, Fukuroi, both of Japan, assignors to NSK-Warner K.K., Tokyo, Japan
Filed Jun. 2, 2000, Appl. No. 585,404
Claims priority, application Japan, Jun. 22, 1999, 11-175357
Int. Cl. F16D *69/00; 13/64*
U.S. Cl. 192—107 R **54 Claims**



37. A frictional material segment having:

an inner periphery;

an outer periphery;

sides joined to said inner periphery and said outer periphery at corner portions; and

a concave cut-away portion provided at at least one of said corner portions.

US 6,409,007 B1

MECHANISM FOR AUTOMATICALLY DIRECTING AND DISPENSING PARTS

Stephane Malon, Romans, France, assignor to ADMV, Cremieu, France

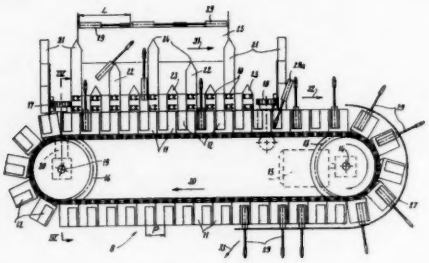
PCT No. PCT/FR99/01080, § 371 Date Jan. 23, 2001, § 102(e) Date Jan. 23, 2001, PCT Pub. No. WO99/58433, PCT Pub. Date Nov. 18, 1999

PCT Filed May 7, 1999, Appl. No. 700,260

Claims priority, application France, May 14, 1998, 98 06336

Int. Cl. B65G *47/14*

U.S. Cl. 198—396 **10 Claims**



1. Mechanism for the automatic orientation and dispensing of parts (**29**) that have an offset center of gravity with respect to the middle of their length (L), characterized in that it has essentially, in combination:

a first endless chain (**9**), extending in a vertical or oblique plane, with a horizontal upper strand, this first endless chain (**9**) bearing cups (**11**) distributed at regular spacing (P) over its full length, each cup having a receptacle (**12**) suitable for receiving one part (**29**),

a second endless chain (**10**), extending in a plane perpendicular to that of the first endless chain (**9**), appreciably at the level of the upper strand of this first chain (**9**), the second endless chain (**10**) bearing moving guides (**21**, **22**, **23**) distributed evenly over its full length with the same spacing (P) as the above-mentioned cups (**11**), the moving guides (**21**, **22**, **23**) passing above the cups (**11**) of the upper strand of the first endless chain (**9**) being situated to correspond with the intervals between the receptacles (**12**) of these cups (**11**),

synchronized, motorized drive means (**13** to **20**) for these two endless chains (**9**, **10**), and

means (**7**, **25**) to feed the parts (**29**) onto said chains (**9**, **10**), and means to guide the descent by gravity of said parts (**29**), feeding them to meet the moving guides (**21**, **22**, **23**) before they fall into the receptacles (**12**) of the cups (**11**) of the upper strand of the first endless chain (**9**).

US 6,409,008 B1

TURNOVER CONVEYOR

John R. Newsome, 15987 N. 700th St., Shumway, Ill. 62461

Filed Feb. 15, 2001, Appl. No. 784,698

Int. Cl. B65G *47/24;15/00;17/00;29/00;* **B65H** *29/00*

U.S. Cl. 198—403 **32 Claims**

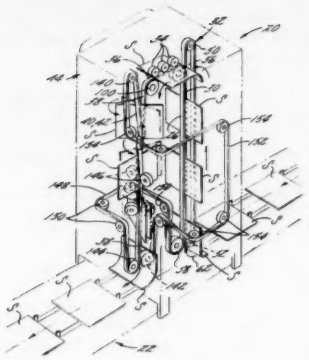
2. A turning apparatus that is capable of occupying a relatively small amount of floor space and is for receiving a stream of signatures and turning over the signatures, comprising:

a frame; and

a conveyor system mounted to the frame for carrying the stream of signatures, the conveyor system including:

a driven first belt having an upright upstream flight for engaging and conveying the stream of signatures in an upward direction, and an upright downstream flight that is downstream of the upstream flight in the stream of signatures and is for engaging and conveying the stream of signatures in a downward direction, with one of the flights having a twisted section that is twisted substantially 180 degrees about an axis parallel to the flight, and

a driven second belt having a twisted section that is twisted substantially 180 degrees, runs in face-to-face relation with the twisted section of the first belt, and is for engaging and conveying the stream of signatures so that the twisted sections of the first and second belts cooperate to twist the stream of signatures substantially 180 degrees about the axis while conveying the stream of signatures.



US 6,409,009 B1

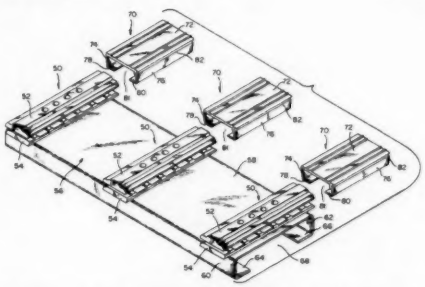
CONVEYOR SLAT CONNECTOR AND CONNECTION METHOD

Raymond Keith Foster, P.O. Box 1, Madras, Oreg. 97741

Filed Jul. 5, 2000, Appl. No. 610,037

Int. Cl. B65G *25/04*

U.S. Cl. 198—750.2 **45 Claims**



1. Apparatus for connecting a reciprocating conveyor slat having an inner space and laterally spaced apart bottom flanges, to a drive beam that is situated below the bottom flanges, said apparatus comprising:

an upper clamp member fitable into the inner space of the conveyor slat and having side portions positionable above the bottom flanges;

a lower clamp member connected to the drive beam and having side portions below the bottom flanges; and

at least one bolt having a head and a threaded shank, said bolt being insertable upwardly through openings in the drive beam and the lower clamp member and being threadable into a threaded opening in the upper clamp member, whereby said bolt can be tightened to pull the upper clamp member downwardly and firmly clamp the bottom flanges of the conveyor slat between the side portions of the upper and lower clamp members, allowing the conveyor slat to be connected to the drive beam without the use of fastener holes in the top of the conveyor slat.

US 6,409,010 B1

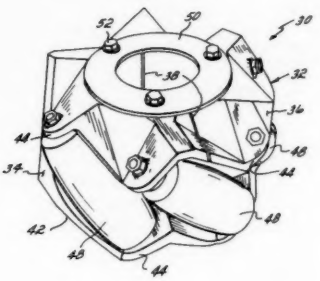
SPLIT DRIVE COMPONENT WITH MAINTAINED ALIGNMENT

Michael A. Leon, Orlando, Fla., assignor to FMC Corporation, Chicago, Ill.

Filed May 17, 2000, Appl. No. 572,271

Int. Cl. B65G *39/10;13/02*

U.S. Cl. 198—786 **19 Claims**



1. A conveyor for moving an article comprising:

a frame;

a plurality of drive shafts rotatably mounted on said frame and positioned substantially parallel to each other, each of said drive shafts including an axis of rotation;

a plurality of cluster roller assemblies mounted with a spaced arrangement on said plurality of drive shafts, each of said cluster roller assemblies having a roller support member and a plurality of rollers rotatably mounted to said roller support member, said roller support member having a first half member, a second half member joined with said first half member, and an opening extending through said first and said second half members, said opening receiving one of said drive shafts and having a central axis aligned with one of said axes of rotation, said first and said second half members bisected along a dividing plane containing said central axis and spaced apart relative to said dividing plane by a gap;

a plurality of alignment holes in said roller support member, each of said alignment holes divided by said gap and aligned with said central axis;

a plurality of spacer pins received within respective ones of said alignment holes; and

a motor connected to rotatably drive at least one of said drive shafts relative to said axis of rotation for moving the article on said cluster roller assemblies relative to said frame.

US 6,409,011 B1

GATE CONVEYOR

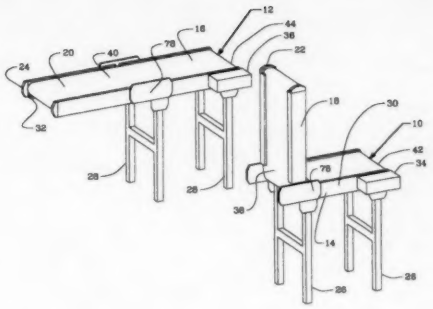
Gregory A. Ferguson, New Bedford, Mass., assignor to Precision Handling Devices, Inc., Fall River, Mass.

Filed May 24, 2000, Appl. No. 577,093

Int. Cl. B65G *21/14*

U.S. Cl. 198—861.3 **8 Claims**

1. A conveyor having a fixed section and gate section which defines the width and length of said conveyor, said sections having adjacent ends in end to end relationship, a conveyor belt supported and extending around said sections to define an endless loop, said gate section being rotatably connected to said fixed section at said adjacent ends for movement between an open position, providing a clear passageway across the width of said conveyor via said gate section, and a closed position, and wherein a joint provides the



rotatable connection between said sections, said joint being entirely within the confines of said loop.

US 6,409,012 B2

DISK CARTRIDGE STORAGE CASE AND INDEX CARD

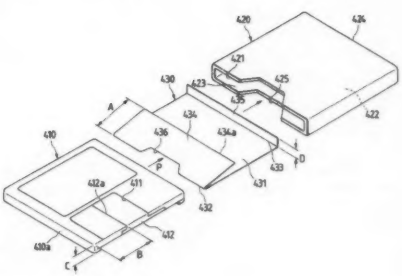
Hideaki Shiga; Kazuo Mukouhara, both of Kanagawa; Kazuaki Taga, and Yutaka Senda, both of Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of application No. 08/916,614, filed on Aug. 22, 1997, now Pat. No. 5,960,948. This application Jul. 13, 1999, Appl. No. 352,635.

Claims priority, application Japan, Aug. 23, 1996, 8-222784; Aug. 23, 1996, 8-222785; Aug. 23, 1996, 8-222786; Aug. 23, 1996, 8-222787; Aug. 23, 1996, 8-222788

Int. Cl. B65D *85/57*

U.S. Cl. 206—232 **3 Claims**



1. A combination of an index card and a cartridge storage case comprising:

a cartridge storage case having a storage portion designed for storing a cartridge with a built-in disk-like recording medium and an index card, the case having an insertion port to receive the cartridge and the card; and,

the index card comprising a card body having a base end and a folded edge opposite the base end, the card body to be inserted in a preset direction through said insertion port into said storage portion of said cartridge storage case, the base end having a spine portion, and

a folded part which is formed by bending a free end part of said card body toward the base end at the folded edge in a double folding manner, wherein the folded part has a front side contacted with the card body and a back side contacted with the cartridge after the folded part is folded and the cartridge is inserted in the cartridge storage case, and wherein the folded part has a predetermined length that is less than a length of the card body between the folded edge and the base end, and wherein the folded edge and folded part are positioned such

that a cartridge slides over the folded edge and folded part when the cartridge is inserted into the cartridge storage case.

US 6,409,013 B1

COMPACT DISK CASE WITH STACKABLE SLEEVES

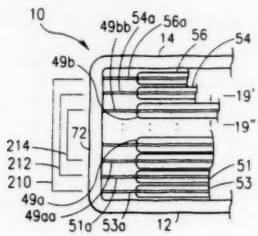
Ezra D. Eskandry, 1925 Brickell Ave., D901, Miami, Fla. 33129

Continuation-in-part of application No. 09/410,844, filed on Oct. 1, 1999, now Pat. No. 6,186,321, which is a continuation-in-part of application No. 09/170,442, filed on Oct. 13, 1998, now Pat. No. 6,012,575, which is a continuation of application No. 08/904,399, filed on Jul. 31, 1997, now Pat. No. 5,826,717. This application Nov. 8, 2000, Appl. No. 708,818.

This patent is subject to a terminal disclaimer.

Int. Cl. B65D *85/57*; **B60R** *7/00*

U.S. Cl. 206—308.1 **24 Claims**



1. A carrying case for compact disks comprising:

an outer enclosure defined by two clam-shell members, each clam-shell member having an interfacing edge which mates with a corresponding interfacing edge on the other clam-shell member and means for closing said interfacing edges together when said clam-shell members are closed to form said outer enclosure, said clam-shell members hinged together with a member hinge along a portion of said respective interfacing edges;

a plurality of compact disk carrying plates hinged together by a corresponding plurality of plate hinge segments along a spine on said member hinge;

respective opposing plate hinge segments corresponding to opposing plates and an intervening portion of said spine forming a progressively increasing longer spanning hinge which establishes an increasingly longer span distance between said respective opposing plates and defining at least a minimum and at least a maximum spanning hinge length between said respective opposing plates; and,

a maximum length spanning hinge disposed proximate the clam-shell member hinge, a minimum length spanning hinge adapted to be closed on itself such that its respective opposing plates are proximally facing when said disk carrying plates are disposed in said outer enclosure.

10. A carrying case for compact disks comprising:

an outer enclosure defined by two clam-shell members, each clam-shell member having an interfacing edge which mates with a corresponding interfacing edge on the other clam-shell member and means for closing said interfacing edges together when said clam-shell members are closed to form said outer enclosure, said clam-shell members hinged together via a member hinge along a portion of said respective interfacing edges;

a plurality of compact disk carrying plates hinged together by a corresponding plurality of plate hinge segments along a spine on said member hinge, at least one of said compact disk carrying plates is a multiple disk carrier adapted to carry a plurality of compact disks on a single plate surface thereon, said at least one multiple disk carrier including multiple compact disk retaining pouches on a respective plate surface thereof;

respective opposing plate hinge segments corresponding to opposing plates and an intervening portion of said spine forming progressively increasing longer spanning hinge which establishes an increasingly longer span distance between said respective opposing plates and defining at least a minimum and at least a maximum spanning hinge length between said respective opposing plates; and,

a maximum length spanning hinge disposed proximate the clam-shell member hinge, a minimum length spanning hinge adapted to be closed on itself such that its respective opposing plates are proximally facing when said disk carrying plates are disposed in said outer enclosure.

US 6,409,014 B1

CD JEWEL CASE

Michael L. Hummell; Brian Donald Hayes, both of Newport Beach, and John Paul Ayers, Brea, all of Calif., assignors to Stomp, Inc., Irvine, Calif.

Filed Feb. 26, 2001, Appl. No. 793,066

Int. Cl. B65D *85/57*

U.S. Cl. 206—308.1 **21 Claims**

1. A jewel case for an optical disc having a central aperture, said jewel case comprising:

a bottom forming a first half of the case and having a generally rectangular shape with rounded corners;

a top forming a second half of the case and having a shape conforming to the bottom shape, said top having a centered hole therein;

a hinge interconnecting said bottom and said top for enabling manual opening and closing of the case;

a hub formed in the bottom for centering the disc on the bottom and within the case, said hub including an engagement surface for releasably holding the disc to the bottom, said hub having a diameter smaller than a top hole diameter and a height sufficient to extend through the top hole when the case is closed;

a shoulder formed in a top of said hub around a perimeter thereof, said shoulder having a diameter greater than a diameter of the top hole, the top having a flexibility enabling the top hole to be manually forced passed said shoulder during opening and closing of the case; and

arcuate ribs for reinforcing said bottom, the ribs being formed in said bottom in a circular pattern with a diameter for accommodating the optical disc therebetween, the ribs having a height greater than a thickness of the optical disc for engaging the top and enabling the optical disc to float between the top and the bottom upon case closure, the ribs having spaces therebetween for enabling finger tip access to the optical disc for removal of the optical disc from the hub.

US 6,409,015 B1

TOOL PACK WITH A FLEXIBLE PORTION AND A TRY-ON DEVICE

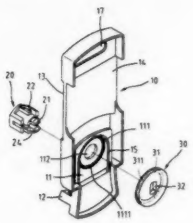
Bobby Hu, 8th Floor, Suite 1, No. 536, Da-Jinn Street, Nan Twen, Taichung, Taiwan

Filed Jan. 22, 2001, Appl. No. 765,354

Claims priority, application Taiwan, Sep. 7, 2000, 89215602 U

Int. Cl. B65D *73/00*

U.S. Cl. 206—378 **17 Claims**



1. A tool pack comprising:

a board including a hole, the board further including an annular toothed portion surrounding the hole;

a sounding plate including a positioning hole, the sounding plate further including an annular toothed portion on a side thereof and surrounding the positioning hole; and

a rotary member having a first end and a second end, the first end of the rotary member being extended through the positioning hole of the sounding plate and the hole of the board to allow simultaneous rotation of the rotary member and the sounding plate relative to the board with the annular toothed portion of the sounding plate meshing with the annular toothed portion of the board, the second end of the rotary member being adapted to be engaged with an end of a tool to rotate therewith;

wherein the sounding plate is turned when the rotary member is turned, and the annular toothed portion of the sounding plate moves across the annular toothed portion of the board to generate clicks.

10. A tool pack comprising:

a board including an annular toothed portion; and

a rotary member having a first end and a second end, the first end of the rotary member including an end face with an annular toothed portion, the first end of the rotary member being engaged with the board to allow rotation of the rotary member relative to the board with the annular toothed portion of the rotary member meshing with the annular toothed portion of the board, the second end of the rotary member being adapted to be engaged with an end of a tool to rotate therewith;

wherein when the rotary member is turned, the annular toothed portion of the rotary member moves across the annular toothed portion of the board to generate clicks; and

wherein the board includes a non-rectilinear slot to thereby define a flexible portion including the annular toothed portion of the board, whereby the annular toothed portion of the board is moved slightly away from the annular toothed portion of the rotary member during rotation of the sounding plate to reduce wear to the annular toothed portion of the board and the annular toothed portion of the rotary member.

15. A tool pack comprising:

a board including an annular toothed portion; and

a rotary member having a first end and a second end, the first end of the rotary member including an end face with an annular toothed portion, the first end of the rotary member being engaged with the board to allow rotation of the rotary member relative to the board with the annular toothed portion of the rotary member meshing with the annular toothed portion of the board, the second end of the rotary member being adapted to be engaged with an end of a tool to rotate therewith;

wherein when the rotary member is turned, the annular toothed portion of the rotary member moves across the annular toothed portion of the board to generate clicks; and

wherein the board includes a non-rectilinear slot to thereby define a flexible portion including the annular toothed portion of the board, the flexible portion being capable of reducing a profile of a tool packed by the tool pack.

16. A tool pack comprising:

a board including an annular toothed portion; and

a rotary member having a first end and a second end, the first end of the rotary member including an end face with an annular toothed portion, the first end of the rotary member being engaged with the board to allow rotation of the rotary member relative to the board with the annular toothed portion of the rotary member meshing with the annular toothed portion of the board, the second end of the rotary member being adapted to be engaged with an end of a tool to rotate therewith;

wherein when the rotary member is turned, the annular toothed portion of the rotary member moves across the annular toothed portion of the board to generate clicks;

wherein the board further includes a frame for limiting rotation of the tool; and

wherein the board includes an engaging hole, and wherein the frame comprises a first end pivotally connected to the board and a second end releasably engaged with the engaging hole of the board.

17. A tool pack comprising:

a board including an annular toothed portion; and

a rotary member having a first end and a second end, the first end of the rotary member including an end face with an annular toothed portion, the first end of the rotary member being engaged with the board to allow rotation of the rotary member relative to the board with the annular toothed portion of the rotary member meshing with the annular toothed portion of the board, the second end of the rotary member being adapted to be engaged with an end of a tool to rotate therewith;

wherein when the rotary member is turned, the annular toothed portion of the rotary member moves across the annular toothed portion of the board to generate clicks; and

wherein the board includes a peg and the annular toothed portion of the board surrounds the peg, and wherein the first end of the rotary member is rotatably engaged in the peg of the board.

US 6,409,016 B1

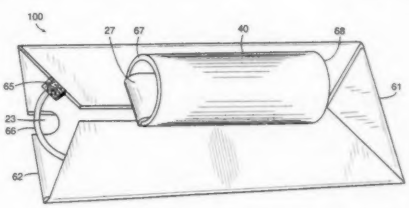
HOLDER AND DISPENSER FOR SPOOLS, TUBE-SHAPED DEVICES, AND CYLINDRICAL DEVICES WITH RECESSED ENDS

Michael Braginsky, Newton; Joan Goldberg, Somerset, and John J. Piekos, Assonet, all of Mass., assignors to Genzyme Corporation, Cambridge, Mass.

Filed Jun. 27, 2000, Appl. No. 604,383

Int. Cl. B65D *85/00*

U.S. Cl. 206—397 **40 Claims**



1. A medical device including a spool, tube-shaped device or cylindrical device with recessed ends and a device blank with a distal and proximal end that is approximately symmetric about a centerline, wherein the device blank further comprises:

a. a plurality of primary folding lines, wherein the primary folding lines segregate the device blank into a base panel and a plurality of flaps; and

b. at least two slits, that are made in the base panel, wherein the slits define a tab and a windowed tab, which can be inserted into a distal and proximal end of the spool, tube-shaped device or cylindrical device.

14. A device for holding spools, tube-shaped devices or cylindrical devices with recessed ends, comprising a device blank with a distal and proximal end that is approximately symmetric about a centerline, wherein the device blank further comprises:

a plurality of primary folding lines, wherein the primary folding lines segregate the device blank into a base panel and a plurality of flaps; and

at least two slits, that are made in the base panel, wherein the slits define a tab and a windowed tab, which can be inserted into a distal and proximal end of a spool, tube-shaped device or cylindrical device with recessed ends wherein the plurality of flaps further comprises a pair of side flaps, a windowed end flap, and a solid end flap; and

wherein a small foam pad to retain the tip of a surgical suture needle is adhesively affixed to the windowed end flap.

15. A device for holding spools, tube-shaped devices or cylindrical devices with recessed ends, comprising a device blank with a distal and proximal end that is approximately symmetric about a centerline, wherein the device blank further comprises:

a plurality of primary folding lines, wherein the primary folding lines segregate the device blank into a base panel and a plurality of flaps; and

at least two slits, that are made in the base panel, wherein the slits define a tab and a windowed tab, which can be inserted into a distal and proximal end of a spool, tube-shaped device or cylindrical device with recessed ends; and

wherein at least one of said tabs, comprises a hinged end, a free end that has shape, an upper and a lower secondary folding line, and a pair of tertiary folding lines.

23. A method of manufacturing a device for holding a surgical device, having a pair of apertures;

wherein the device comprises a device blank formed with a distal and a proximal end that is approximately symmetric about a centerline, wherein the method of manufacturing the device blank further comprises:

a. forming a plurality of primary folding lines, wherein the primary folding lines segregate the device blank into

i. a base panel,

ii. a pair of side flaps,

wherein a pair of slits are incised on each pair of side flaps;

iii. a windowed end flap is formed, having an edge, at the proximal end of the device blank, which has a retaining means thereon;

wherein a small opening is cut with a shape that is approximately symmetrical about the centerline; and

iv. a solid end flap is formed, having an edge, at the distal end of the device blank; and

b. at least two slits are formed that penetrate the base panel,

wherein the slits define a tab at the distal end of the device blank;

wherein the tab comprises a hinged end, a free end, an upper and a lower secondary folding line, and a pair of tertiary folding lines;

and a windowed tab at the proximal end of the device blank;

wherein the windowed tab comprises a hinged end, a free end, an upper and a lower secondary folding line, and a pair of tertiary folding lines.

30. A method of manufacturing a device for holding a surgical device, having a pair of apertures;

wherein the device comprises a device blank with a distal and a proximal end that is approximately symmetric about a centerline, wherein the device blank further comprises:

a plurality of primary folding lines, wherein the primary folding lines segregate the device blank into

iii. a base panel,

iv. a pair of side flaps,

wherein a pair of slits is incised on each pair of side flaps;

iii. a windowed end flap, having an edge, at the proximal end of the device blank, which has a retaining means thereon;

wherein is cut a small opening with a shape that is approximately symmetrical about the centerline; and

iv. a solid end flap, having an edge, at the distal end of the device blank; and

at least two slits that penetrate the base panel,

wherein the slits define a tab at the distal end of the device blank;

wherein the tab comprises a hinged end, a free end, an upper and a lower secondary folding line, and a pair of tertiary folding lines;

and a windowed tab at the proximal end of the device blank;

wherein the windowed tab comprises a hinged end, a free end, an upper and a lower secondary folding line, and a pair of tertiary folding lines;

wherein the steps of manufacture comprise:

a. folding the tab upward by rotating the free end of the tab about the lower secondary folding line at the hinged end of the tab;

b. folding the windowed tab upward by rotating the free end of the windowed tab about the lower secondary folding line at the hinged end of the windowed tab;

c. folding the tab inward about the upper secondary folding line, forming a tab tip;

d. folding the windowed tab inward about the upper secondary folding line, forming a windowed tab tip;

e. inserting the tab tip and windowed tab tip into the pair of apertures of the surgical device;

f. folding the windowed end flap upward and inward approximately 180 degrees until the edge of the windowed end flap is near the lower secondary folding line of the windowed tab;

g. folding the solid end flap upward and inward approximately 180 degrees until the edge of the solid end flap is near the lower secondary folding line of the tab; and

h. folding the pair of side flaps upward and inward approximately 180 degrees until the tab and the windowed tab are inserted in the pair of slits.

US 6,409,017 B1

USE OF INHIBITOR IN OPTICAL FIBER REEL COVERS

Dana C. Bookbinder, Corning, and J. Richard Toler, Painted Post, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jun. 30, 2000, Appl. No. 608,546

Int. Cl. B65D *85/04;* **F21V** *9/06*

U.S. Cl. 206—398 **23 Claims**

1. An optical fiber reel cover comprising a polymer and a UV light inhibitor, wherein the cover exhibits a transmission of less than about 50% of light wavelengths shorter than about 420 nm and a transmission of more than about 55% of light wavelengths in the range of about 450 to about 700 nm.

US 6,409,018 B1

CADDY OF SHIRRED FOOD CASING STICKS

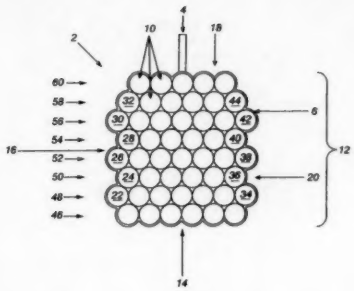
Alfonso Ricardo Suarez Manzano, Michoacan, Mexico, assignor to Arteva North America S.A.R.L., Zurich, Switzerland

Filed Mar. 21, 2001, Appl. No. 813,903

Int. Cl. B65D *71/08*

U.S. Cl. 206—443 **16 Claims**

1. A caddy having a plurality of shirred food casing sticks arranged in a unique configuration, wherein said configuration comprises: a first row containing six of said shirred food casing

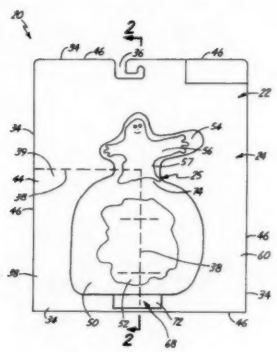


sticks; a second row containing seven of said shirred food casing sticks; a third row containing six of said shirred food casing sticks; a fourth row containing seven of said shirred food casing sticks; a fifth row containing six of said shirred food casing sticks; a sixth row containing seven of said shirred food casing sticks; a seventh row containing six of said shirred food casing sticks; and an eighth row containing five of said shirred food casing sticks.

US 6,409,019 B1
THREE DIMENSIONAL PACKAGING

James R. Hornsby, St. Louis, and Marcellus R. Benson, Chesterfield, both of Mo., assignors to Trendmasters, Inc., St. Louis, Mo.

Filed Dec. 17, 1999, Appl. No. 466,142
Int. Cl. B65D *73/00*
U.S. Cl. 206—471 **3 Claims**



1. A package for containing a product to be sold, comprising:

(a) a cardboard backer board. defining:

a front surface adapted to receive a first graphical design;

a generally planar rear surface adapted to receive a second graphical design;

a plurality of edges; and

a hanging aperture in close proximity to at least one of the plurality of edges;

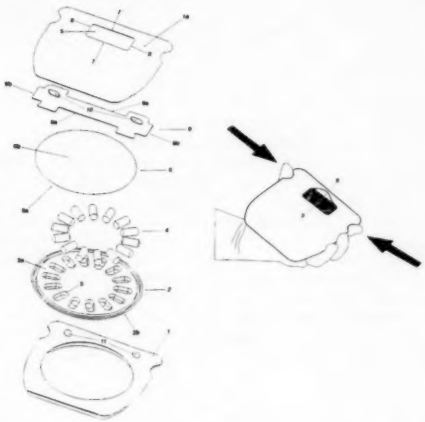
(b) a generally transparent front panel, at least a portion of which has a three-dimensional structure and a generally planar rim, the rim being generally adjacent to the edges of the backer board and adhesively connected to the front surface of the backer board, wherein the backer board and the three-dimnensional structure cooperate to define a product receiving pocket; and

(c) a figural item attached to the backer board, the figural item having a three-dimensional outer presentation surface and a generally planar rim.

US 6,409,020 B1
CHILD-RESISTANT BLISTER PACKAGE

Julian B. Lo, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Provisional application No. 60/147,968, filed on Aug. 9, 1999. This application Aug. 4, 2000, Appl. No. 631,578.
Int. Cl. B65D *83/04*
U.S. Cl. 206—533 **4 Claims**



3. A housing for retaining a blister package, said housing having an opening therein defining a dispensing aperture, wherein said housing comprises:

a substantially rigid backing sheet substantially co-extensive with, and substantially blocking, said dispensing aperture wherein said backing sheet comprises side edges, and exposed end portions, such that;

pressure applied in a direction parallel to said side edges upon either exposed end portion individually, or on both exposed end portions simultaneously, of said backing sheet, imparts arcuate flexure thereto, and dislocation thereof, from said substantially co-extensive, and substantially blocking position, to a position wherein said dispensing aperture is unblocked; and

release of pressure on either exposed end portion individually, or on both exposed end portions simultaneously, of said backing sheet relaxes arcuate flexure thereof such that said substantially co-extensive, and substantially blocking position, wherein said backing sheet substantially blocks said dispensing aperture, is restored.

US 6,409,021 B1
FOOD SERVING TRAY

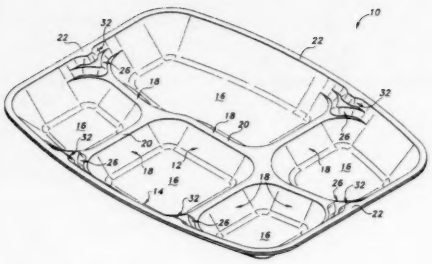
Richard L. Ramirez, Lawrenceville, and Mark A. Bergeron, Lithonia, both of Ga., assignors to Tekni-Plex, Inc., Somerville, N.J.

Filed Aug. 16, 2000, Appl. No. 639,594
Int. Cl. B65D *1/36*
U.S. Cl. 206—564 **9 Claims**

1. A tray for serving food, said tray comprising:

a base having at least two bottom walls, and at least one partition interposed between, and connecting, two of said bottom walls; and

a plurality of side walls extending from and bounding said base, wherein at least one of said partitions intersects with, and is connected to, a first of said side walls, wherein at least one first protrusion is formed in said first side wall located between a crest of said partition and a top edge of said first side wall, said first protrusion being step-shaped with a first top surface facing generally in the same direction as said base,



and a first riser surface having at least portions extending between said crest of said partition and said first top surface, said first top surface being recessed below said side walls so as to be located within a volume encompassed by said base and said side walls, and wherein at least one second protrusion is formed in said first side wall located between said first top surface of said first protrusion and said top edge of said first side wall, said second protrusion being step-shaped with a second top surface facing generally in the same direction as said base, and a second riser surface having at least portions extending between said first top surface of said first protrusion and said second top surface, said second top surface having at least portions coplanar with said top edge of said first side wall.

US 6,409,022 B1

MINERAL COLLECTOR COMPOSITIONS AND PROCESSES FOR MAKING AND USING SAME

Alan S. Rothenberg, Wilton, and Lino Giovanni Magliocco, Shelton, both of Conn., assignors to Cytec Technology Corp., Wilmington, Del.

Division of application No. 09/085,364, filed on May 27, 1998, now Pat. No. 6,145,667. This application Sep. 15, 2000, Appl. No. 663,721.

Int. Cl. B03D *1/01; 1/006*

U.S. Cl. 209—166 **8 Claims**

1. A method for the removal of impurities from a non-sulfide mineral ore, the method comprising:

forming an aqueous slurry of the mineral ore,

conditioning the mineral ore slurry with the mineral collector composition comprising a mixture of a C_6 to C_{22} fatty hydroxamic acid, a triglyceride oil, wherein said oil is an ester of glycerol with fatty acids, and an amount of starting C_6 to C_{22} ester that is less than that of the C_6 to C_{22} fatty hydroxamic acid, and

separating the impurities and the mineral collector composition from the mineral ore slurry.

US 6,409,023 B1

PROCESS AND DEVICE FOR FRACTIONING A SUSPENSION CONTAINING PAPER FIBERS

Samuel Schabel, Ravensburg, Germany, assignor to Voith Sulzer Papiertechnik Patent GmbH, Ravensburg, Germany

Filed Oct. 26, 2000, Appl. No. 696,182

Claims priority, application Germany, Oct. 27, 1999, 199 51 711

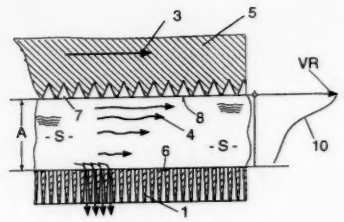
Int. Cl. B07B *1/06*

U.S. Cl. 209—283 **33 Claims**

1. A device for fractioning a suspension containing paper fibers, in which the suspension is separated into at least two fractions, said device comprising:

at least one wire having an inlet side with openings; and

a scraper having a closed rough surface provided adjacent said at least one wire;



wherein said scraper is movable substantially parallel to said inlet side of said at least one wire and said closed rough surface is arranged to drag the suspension over said wire, whereby clogging of said openings of said wire is substantially prevented.

US 6,409,024 B1

BLOOD PROCESSING DEVICE

Hidekazu Nakashima, Yasu-gun; Hiroyuki Sugaya, Otsu; Hiroshi Matsumoto, Otsu; Madoka Kawashima, Otsu; Katsuyoshi Ichikawa, Okazaki, and Tsutomu Uesaka, Kyoto, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

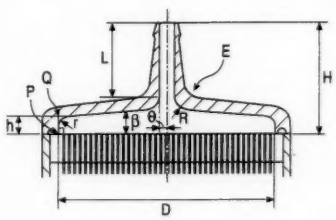
PCT No. PCT/JP99/04649, § 371 Date Apr. 20, 1999, § 102(e) Date Apr. 20, 1999, PCT Pub. No. WO00/12154, PCT Pub. Date Mar. 9, 2000

PCT Filed Aug. 27, 1999, Appl. No. 529,793

Claims priority, application Japan, Aug. 27, 1998, 10-241746; Oct. 21, 1998, 10-299438; Oct. 21, 1998, 10-299439; Oct. 21, 1998, 10-299440

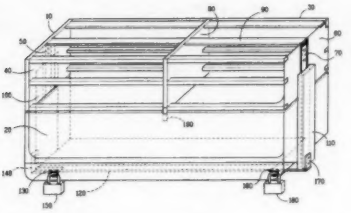
Int. Cl. B01D *63/02*

U.S. Cl. 210—456 **7 Claims**



1. A blood processing apparatus having a hollow fiber bundle fixed to a housing by a partition with an end portion of the hollow fiber bundle opened, and a blood port provided with a blood intake attached to said end portion, the blood intake having an interior wall and an exterior wall; wherein an angle of the blood intake interior wall provided to said blood port has an inclination θ of 1.5° or less as to a center axis of said blood port, and the expression 0.08 D≦h≦0.1 3 D holds, wherein an inner surface of the blood port has a smooth surface or has an inner plane coarseness of up to 0.3 μm per 0.1 mm reference length, and Q represents the intersection between a hypothetical line which passes through the end portion P of the inner plane of said blood port and is orthogonal with said partition and a hypothetical extension line from the ceiling plane of said blood port, h represents the distance between said partition and said intersection Q, and D represents the diameter at the end portion of the inner plane of said blood port.

US 6,409,025 B1
GUARD FOR RESTRICTING ACCESS TO A RACK OF GOODS
John P Moon, 4407 Woodfield Dr., Hahira, Ga. 31632
Filed Feb. 23, 2001, Appl. No. 792,086
Int. Cl. E05B *73/00*
U.S. Cl. 211—4 **19 Claims**



1. A guard for restricting access to a rack of goods which comprises:

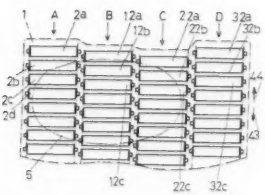
i) an access-restricting cover having an open bottom, a left side to which is substantially vertically mounted a left side track means, and a right side to which is substantially vertically mounted a right side track means;

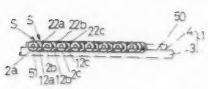
ii) a left extensible member comprising a left extensible member track means which is lockably engageable with the left side track means so as to slide said left extensible member from a retracted storage position to an extended use position;

iii) a right extensible member comprising a right extensible member track means which is lockably engageable with the right side track means so as to slide said right extensible member from a retracted storage position to an extended use position; and

iv) a bottom member having a left end reversibly securable to a lower end of said left extensible member, and a right end reversibly securable to a lower end of said right extensible member.

US 6,409,026 B2
SHOWCASE ASSEMBLY UNIT FOR SHOWCASE STRUCTURE
Mikio Watanabe, Tokyo, Japan, assignor to Kid Co., Ltd., Tokyo, Japan
Filed Feb. 27, 2001, Appl. No. 793,136
Claims priority, application Japan, Feb. 29, 2000, 2000-054727
Int. Cl. B65G *13/00;* **A47F** *1/00*
U.S. Cl. 211—59.2 **4 Claims**





1. A showcase assembly unit for a showcase structure, comprising:

a roller support frame having a rear end and a front end; and

parallel sets of rollers mounted on said roller support frame, wherein each of the rollers of each of said parallel sets

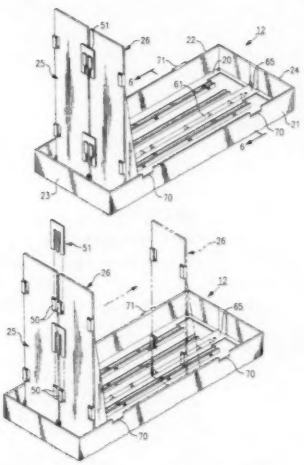
(i) is rotatably mounted to said roller support frame and arranged one after another from the rear end of said roller support frame to the front end of said roller support frame,

(ii) is axially offset relative to a corresponding roller of an immediately adjacent one of said parallel sets in a direction from the rear end of said roller support frame to the front end of said roller support frame, and

(iii) has a width that is less than a bottom dimension of a commercial article that is to be supported by the rollers such that when a plurality of the commercial articles are supported by the rollers the commercial articles extend across at least two of said parallel sets and can be moved one by one along the rollers from the rear end of said roller support frame to the front end of said roller support frame, and

wherein said roller support frame includes a lower bearing segment and an upper bearing segment mounted on said lower bearing segment, said lower bearing segment having a flat upper surface for supporting a rotary shaft of each of the rollers of each of said parallel sets such that the rotary shafts can be maintained co-planar with one another, and said upper bearing segment having recesses in a lower side that faces said flat upper surface for receiving therein the rotary shafts.

US 6,409,027 B1
DISPENSING TRAY FOR DISPLAY CONSOLE
Dennis L. Chang, East Brunswick, N.J.; Larry R. Enochs, Columbia, Pa.; Mark R. Hernick, Chadds Ford, Pa., and Christopher T. Rich, Lancaster, Pa., assignors to Oneida Ltd., Oneida, N.Y.
Filed Mar. 9, 2001, Appl. No. 802,637
Int. Cl. A47F *5/00*
U.S. Cl. 211—59.3 **11 Claims**



1. Apparatus for displaying and dispensing flat articles that includes

an open top tray that includes a bottom wall, a pair of opposed side walls, a front wall and a rear wall,

a pair of elongated panels slidably mounted in the bottom wall of said tray that extend upwardly from the bottom wall through the open top of the tray; spring means associated with each of the panels for urging the associated panels along independent paths of travel from the rear wall of the tray toward the front wall; and

removable connector means for joining the panels in coplanar alignment so that the panels move together in a side by side relationship whereby articles of varying width can be mounted between the panels and the front wall of the tray.

US 6,409,028 B2

SHELF TRAY SYSTEM

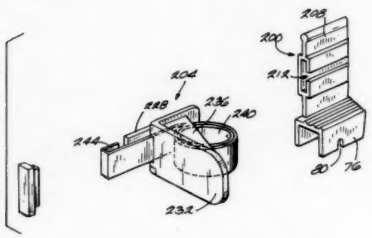
Terry L. Nickerson, Brookfield, Wis., assignor to DCI Marketing, Inc., Milwaukee, Wis.

Continuation of application No. 09/454,784, filed on Dec. 3, 1999, now Pat. No. 6,227,385. This application Mar. 23, 2001, Appl. No. 815,569.

This patent is subject to a terminal disclaimer.

Int. Cl. A47F *1/04*

U.S. Cl. 211—59.3 **17 Claims**



1. A shelving system comprising:

a shelf divider comprising:

a generally vertical panel having a longitudinal extension and defining a longitudinally-extending slot, wherein the slot is defined by a back wall and two L-shaped projections extending away from the back wall, wherein the back wall is non-coplanar with the vertical panel; and

a generally horizontal panel having a longitudinal extension and defining a horizontal support surface, the shelf divider configured to be slidable along a track;

a pusher assembly slidable along the slot on the vertical panel; and

a biasing element biasing the pusher assembly toward a first end of the shelf divider.

US 6,409,029 B1

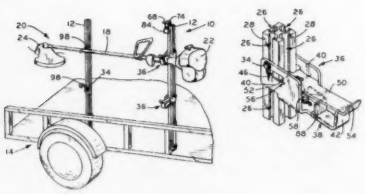
TRIMMER RACK

Steven P. Bermes, Fort Wayne, Ind., assignor to Novae Corporation, Fort Wayne, Ind.

Filed Sep. 3, 1999, Appl. No. 389,714

Int. Cl. A47F *5/00*

U.S. Cl. 211—70.6 **33 Claims**



1. A trimmer rack comprising:

an elongate support member;

a hook member extending from said support member; and,

a pivot arm selectively pivotable over and slidable along said hook member, whereby a trimmer selectively placed on said hook member is selectively retained thereon with said pivot arm.

US 6,409,030 B1

ADAPTER FOR MOUNTING A MODULE ON A CARRIER BAR OF A TEXTILE MACHINE

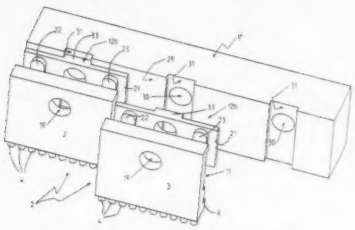
Klaus Schlemper, Solingen, Germany, assignor to Groz-Beckert KG, Albstadt, Germany

Filed Jun. 26, 2000, Appl. No. 603,766

Claims priority, application Germany, Jun. 24, 1999, 199 28 885

Int. Cl. D05C *15/10*

U.S. Cl. 211—70.6 **21 Claims**



1. An assembly for a textile machine, comprising

(a) a carrier bar for attachment to the textile machine;

(b) a plurality of module base bodies lined up in a series along said carrier bar; each said module base body carrying a plurality of tools and each having a mounting; and

(c) a plurality of separate adapters lined up in a series along said carrier bar; said separate adapters being components separately attached to and separately removable from said carrier bar; respective said separate adapters being received in said mounting of respective said module base bodies; each said adapter including holding and orienting means for holding the respective module base body and for orienting the respective module base body relative to said carrier bar independently from an adjoining said module base body, whereby each said adapter can match variously configured module base bodies to variously configured carrier bars.

US 6,409,031 B1

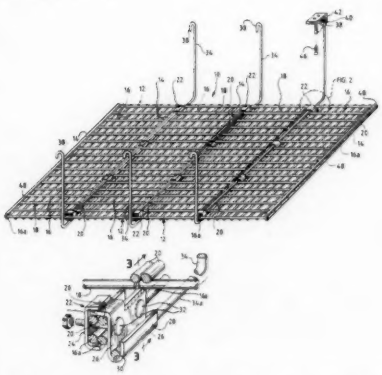
CEILING MOUNTED RACK

Dean Wynne, Hickory Hills, Ill., assignor to Folding Guard Company, Chicago, Ill.

Filed Aug. 31, 2000, Appl. No. 653,106

Int. Cl. A47F *5/00*

U.S. Cl. 211—119 **14 Claims**



1. A rack which comprises at least one wire mesh panel comprising a first array of parallel wires and a second array of parallel wires, the wires of the first and second arrays being in transverse, angular relation and being bonded to each other at least at a substantial number of wire crossing points, said panel defining

opposed parallel side edges which are substantially defined by first individual wires of said first array, and third wires respectively bonded to said panel and positioned parallel and adjacent to said first individual wires of the first array, said third wires being spaced from said first individual wires by crossing wires of the second array, in which a plurality of said wire mesh panels are connected together along said opposed, parallel side edges by a plurality of clamp members, which respectively enclose said first individual wires of the first array and the adjacent third wires.

US 6,409,032 B1

ASSEMBLY OF CONTAINER AND BREAK-OFF CLOSURE AND METHOD OF PRODUCING IT

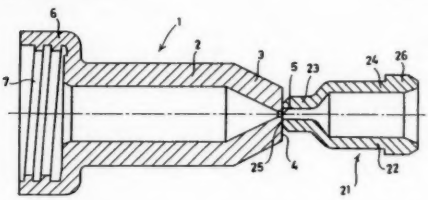
Henricus Antonius Maria Bekkers, GH Mierlo, Netherlands, and Terence Edward Weston, Stradbroke, United Kingdom, assignors to Plastic Moulding Appliances BV, Mierlo, Netherlands, and Weston Medical Limited, Stradbroke, United Kingdom

Continuation of application No. PCT/GB97/02499, filed on Sep. 17, 1997. This application Mar. 17, 1999, Appl. No. 273,802.

Claims priority, application Netherlands, Sep. 18, 1996, 1004059

Int. Cl. B65D *1/02*

U.S. Cl. 215—48 **7 Claims**



1. An assembly of a container and a break-off closure made of plastic, the container comprising a substantially planar surface with a passage extending to an opening in the surface, the opening having a circumference, the container and the break-off closure each having a respective attachment area by which they are sealingly attached to one another, wherein the attachment area of the said planar surface of the container is situated around and at a distance from the circumference of the passage opening, and wherein attachment of the attachment areas to one another is obtained by heating the attachment surface of one of the container and break-off closure to such a temperature that a breakable attachment is formed between them, wherein at least the break-off closure is made of polyethylene terephthalate (PET).

US 6,409,033 B1

DEVICE FOR MAINTAINING EFFERVESCENCE OF A BEVERAGE WITHIN A CONTAINER

Gerald Wilhite, Southlake, and Donald Saller, Garland, both of Tex., assignors to Jokari/US, Carrollton, Tex.

Provisional application No. 60/141,044, filed on Jun. 24, 1999, Provisional application No. 60/176,194, filed on Jan. 14, 2000. This application Jun. 13, 2000, Appl. No. 592,717.

Int. Cl. B65D *51/24*

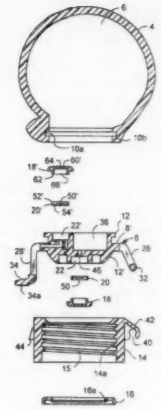
U.S. Cl. 215—228 **12 Claims**

1. A device for maintaining effervescence of a liquid comprising

body means for attachment adjacent to the opening of a container containing a liquid,

said body means having a body air passage in fluid communication with the opening of the container,

snap cap means being pivotally mounted on said body means, said snap cap means being pivotally moveable between a locked position on said body means to an unlocked position on said body means,



pressurizing means being attached to said snap cap means, said pressurizing means being a deformable hollow body having an internal chamber, said hollow body acting to pressurize the container when manually compressed,

said snap cap means having a cap air passage, said cap air passage being in selective fluid communication with said chamber and said body air passage,

said snap cap means further having an external air inlet in communication with said cap air passage to introduce external air into said chamber,

valve means being operatively connected to said external air inlet and said body air passage,

said valve means acting to close said external air inlet and open said body air passage upon said hollow body being manually compressed to displace pressurized air through said cap air passage and said body air passage,

said valve means further closes said body air passage and opens said external air inlet upon release of compression of said hollow body, and

said valve means having a first valve assembly and a second valve assembly each including a valve cap and a valve element.

US 6,409,034 B2

HINGED CONTAINER CAP

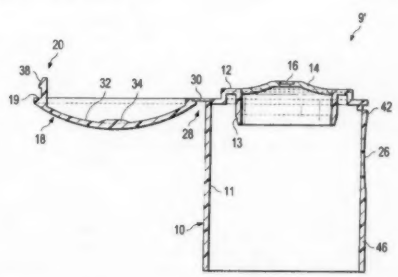
Horst Schorner, Keltern-Weiler, Germany, assignor to Kunststoffwerk Kutterrer GmbH & Co., Germany

Filed Jul. 20, 1999, Appl. No. 357,489

Claims priority, application Germany, Jul. 21, 1998, 198 32 799

Int. Cl. B25D *39/00*

U.S. Cl. 215—237 **15 Claims**



1. A hinged cap including:

a cap body formed for providing a leakproof seal with a receptacle opening, said cap body having an upper boundary wall, a raised portion with an outlet opening arranged therein for a medium contained within the receptacle, wherein the receptacle opening is arranged at the upper boundary wall of the cap body substantially in the center of the upper boundary wall;

a hinged lid connected by a hinge to said cap body for closing of said outlet opening;

locking means disposed on said cap body) and on said hinged lid wherein at least said raised portion is made from an elastically deformable material, and said hinged lid positions tightly against at least a lip of said outlet opening in the closed position of said hinged lid and exerts pressure on said raised portion in the direction of closure; and

an elastically deformable element for generating a biasing force between said cap body and said hinged lid in order to bring said hinged lid into an open position, wherein said elastically deformable element is elastically deformed between said cap body and said hinged lid upon manual closing of said hinged lid and said biasing force automatically pops said hinged lid into the open position when said locking means is manually released.

US 6,409,035 B1

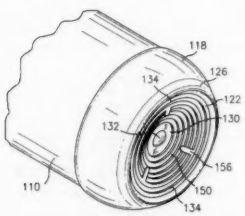
HOLLOW PLASTIC BOTTLES

Richard C. Darr, Medina; Marc A. Pedmo, Litchfield, and James C. Dorn, Norton, all of Ohio, assignors to Plastipak Packaging, Inc., Plymouth, Mich.

Continuation-in-part of application No. 09/724,030, filed on Nov. 28, 2000. This application Jan. 26, 2001, Appl. No. 770,904.

Int. Cl. B65D *90/02*

U.S. Cl. 215—373 **8 Claims**



1. A hollow plastic bottle, which comprises:

a hollow body of thermoplastic material having a generally cylindrical side wall, an upper end with a dispensing opening therein, and a lower supporting base with an inwardly extending portion having an outside surface thereof;

wherein said outside surface of said inwardly extending base includes a continuous outer supporting annular rim for supporting the bottle on a surface;

a central portion of the inwardly extending portion of said base; and

wherein the space between the central portion of the base and the outer supporting rim includes a plurality of substantially uniform, continuous, uninterrupted, circumferential rings forming substantially uniform, continuous, uninterrupted, circumferential, pyramidal ridges and adjacent depressions, wherein said space also includes a plurality of additional substantially uniform, circumferential rings forming pyramidal ridges and adjacent depressions, said additional rings having at least one substantially flat area thereon.

US 6,409,036 B2

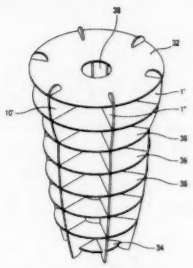
INTERLOCKING CONTAINER

Gary F. Martin, 323 Narcissus Ave., Corona del Mar, Calif. 92625

Provisional application No. 60/177,279, filed on Jan. 21, 2000. This application Jan. 22, 2001, Appl. No. 765,627.

Int. Cl. B65D *6/26*

U.S. Cl. 220—4.28 **17 Claims**



1. A container having an axis of symmetry, comprising:

a plurality of first oriented plates in an spaced relationship about said axis of symmetry, said first plates formed with a plurality of locking grooves,

a plurality of second parallely oriented plates each formed with a plurality of interlocking grooves interlocking with said locking grooves of said first plates,

wherein at least one of said second parallely oriented plates circumscribes at least one of said first oriented plates to thereby retain said first and second plates in relatively fixed spatial relation and defines a recessed containment area extending along said axis of symmetry, said recessed containment area having a bottom and an open top and adapted to receive and support at least one article therein.

US 6,409,037 B1

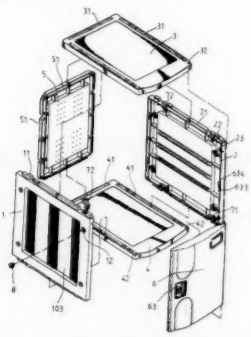
FREELY CONNECTABLE CHEST UNIT

Yu-Sheng Lin, 1F, No. 5, Alley 166, Chorng Yang Rd., Nan Gaang, Taipei, and Kun-Huo Lin, No. 46, St. Jiunn An, Shuh Lin, Taipei Hsien, both of Taiwan

Filed Oct. 31, 2001, Appl. No. 984,690

Int. Cl. B65D *6/16;6/24*

U.S. Cl. 220—4.34 **13 Claims**



1. A freely connectable chest unit, comprising two sidewall panels, a top panel, a bottom panel, a back panel, and a door assembled into said chest unit by means of a first fastening mechanism, a second fastening mechanism, and a door-closing mechanism;

said first fastening mechanism being used to assemble said sidewall panels to said top and said bottom panel, and including more than one first fastening member separately movably

mounted to predetermined points on upper and lower peripheral edges of said two sidewall panels, and receiving spaces formed on said top and said bottom panels corresponding to said first fastening members; each of said first fastening member being adapted to receive in a corresponding one of said receiving spaces at a released position when said two sidewall panels are connected to said top and said bottom panels, and said first fastening member being forward movable from said released position to a fastened position in said receiving space to firmly hold said top and said bottom panel to said sidewall panels;

said second fastening mechanism being used to horizontally connect a first and a second said chest unit to each other side by side, and including more than one second fastening member, each of which including a turning knob, a connecting shaft extended from a rear surface of said turning knob by a length decided in accordance with a total thickness of two adjacent sidewall panels of said first and said second chest unit to be horizontally connected, and a long locking plate extended across a free end of said connecting shaft opposite to said turning knob; and mounting holes provided at predetermined positions along borders of said two sidewall panels of said chest unit; each of said second fastening members being adapted to mount in one of said mounting holes on one of said two sidewall panels of said first chest unit with said turning knob located in said mounting hole and said connecting shaft extended through one of said two sidewall panels of said second chest unit adjacent to said first chest unit to locate said locking plate in a corresponding one of said mounting holes on said sidewall panel of said second chest unit, and said turning knob being turnable to orient said locking plate perpendicularly to said mounting hole on said sidewall panel of said second chest unit and thereby firmly holding said second chest unit to said first chest unit at said two adjacent sidewall panels;

said door-closing mechanism being used to connect said door to any one of said two sidewall panels of said chest unit and including a door-closing member, a mounting compartment provided behind an upper part of said door for mounting said door-closing member therein, a top through hole formed at a top of said mounting compartment, and a pivot shaft provided behind a lower part of said door corresponding to said door-closing member; said door-closing member mainly including a pivot pin having an end upward extended through said top through hole on the top of said mounting compartment, a first elastic element put around said pivot pin to allow said pivot pin to move up and down relative to said door, and a second elastic element put around a lower part of said first elastic element; and said second elastic element having a first hooked end being engaged with said door, and a second hooked end being engaged with said sidewall panel to which said door is connected;

said two sidewall panels being so structured that they are exchangeable to allow horizontal connection of two or more said chest units to one another;

said top and said bottom panel also being structured to be exchangeable in assembling said chest unit to allow vertical connection of two or more said chest units to one another; and

said door-closing member automatically closing said door when said second hooked end of said second elastic element is engaged with said sidewall panel;

and said second hooked end of said second elastic element being removable from said sidewall panel to engage with said door to allow said door to be closed manually.

US 6,409,038 B1

CONVERTIBLE TRAVEL MUG

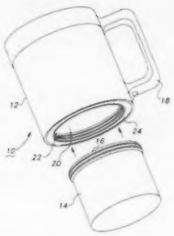
Morry Karp, Beverly Hills, Calif., assignor to Berney-Karp, Inc., Los Angeles, Calif.

Provisional application No. 60/226,657, filed on Aug. 21, 2000. This application Dec. 14, 2000, Appl. No. 737,417.

Int. Cl. B65D *41/56*

U.S. Cl. 220—212 **2 Claims**

1. A travel mug adapted to fit within a vehicle mounted cup receptacle comprising:



an upper cup portion having a circumferential side wall and a bottom, said upper cup portion having a diameter greater than the diameter of the vehicle mounted cup receptacle;

a base portion having a circumferential side wall and a bottom, said base portion having a diameter approximately comparable to the diameter of the vehicle mounted cup receptacle;

coupling means integral with said upper cup bottom and said base portion side wall for separably joining said cup and base portions said coupling means including a recess in said upper cup bottom with peripheral threading and said base portion has complementary threading about the upper part of said base portion side wall, said upper part of said base portion side wall being adapted to fit within said recess so that the combination can be carried in a vehicle mounted cup receptacle; and

a cover member, having side walls with peripheral threading complementary to said complementary threading on said base portion side wall whereby said base portion can alternatively be fitted with said cover member and into said upper cup bottom recess.

US 6,409,039 B2

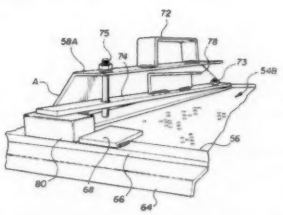
METAL FINISHING BARREL COVER LOCKING SYSTEM

Richard J. Jessup, Bloomfield Hills, Mich., assignor to Jessup Engineering, Inc., Rochester Hills, Mich.

Provisional application No. 60/193,189, filed on Mar. 30, 2000. This application Mar. 21, 2001, Appl. No. 813,649.

Int. Cl. B65D *43/12*

U.S. Cl. 220—345.3 **9 Claims**



1. A perforated finishing barrel assembly including a finishing barrel having a lengthwise extending access opening in one side thereof, and at least one cover fit into said opening, said barrel side having a lengthwise series of tabs formed along said opening and projecting towards said opening, said cover having a series of spaced apart outwardly projecting tabs formed along its length, said respective series of tabs configured to allow said cover tabs to be pushed between said barrel tabs in a lengthwise relative position of said cover over said opening, said cover tabs thereby positioned past said barrel tabs and against said barrel, said cover able to be shifted lengthwise to cause capturing of said cover tabs beneath said barrel tabs to secure said cover on said barrel, the improvement comprising:

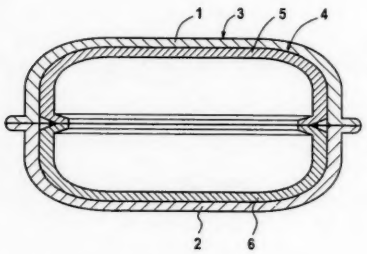
at least one locking handle assembly secured to said cover enabling positioning of said cover on said barrel overlying said opening therein and lifting of said cover from said barrel

opening, said locking assembly including a graspable handle mounted on said cover by a spring blade affixed at one end to said cover and free at the other end which mounts said handle to be deflectable away from said cover to a limited extent, a locking feature fixed to said barrel side positioned opposite said handle when said cover series of tabs are aligned with spaces between said barrel spaces in said lengthwise relative position, said deflectability of said spring blade causing said locking feature to push allowing said cover to be slid to move said cover tabs past said barrel tabs with said handle on said locking feature, said locking feature configured so that said handle moves past said locking feature upon shifting of said cover so as to bring said cover tabs beneath said barrel tabs, whereat a side of said locking feature blocks a portion of said handle assembly to positively prevent shifting endwise movement of said cover in the opposite direction, whereby said cover is locked in position over said barrel side opening.

US 6,409,040 B1
FUEL TANK FOR A MOTOR VEHICLE

Markus Distelhoff; Karl Eck, both of Frankfurt; Winfried Fröhlich, Bad Camberg; Dieter Keller, Aschaffenburg; Justus Klöker, Neu Anspach; Knut Meyer, Essen; Ingo Mohr, Höhn; Bernd Rumpf, Nidderau-Windecken; Wolfgang Sinz, Sulzbach, and Rainer Moser, Idstein, all of Germany, assignors to Mannesmann VDO AG, Germany

Filed Mar. 6, 2000, Appl. No. 520,031
Claims priority, application Germany, Mar. 17, 1999, 199 11 877
Int. Cl. B65D *1/00*
U.S. Cl. 220—562 **3 Claims**



1. A fuel tank for a motor vehicle comprising:

(a) two mating tank shell parts having exterior and interior surfaces joined along a common seam to define an enclosed volume,

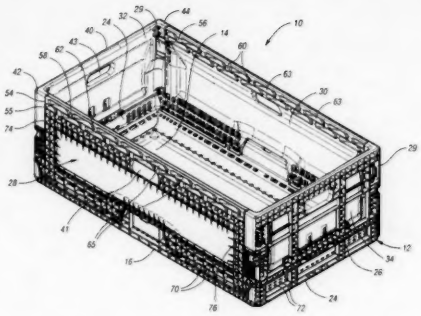
(b) a fuel vapor permeation barrier constructed of two mating shell parts having exterior and interior surfaces joined along a common seam, the shell parts being manufactured separately from the tank shell parts and inserted within the tank shell part volume, wherein the contours of the external surfaces of the permeation barrier shell parts and of the interior surfaces of the tank shell parts are identical, to provide complete areal contact therebetween.

US 6,409,041 B1
CONTAINER

Trenton M. Overholt, Manhattan Beach; Gerald R. Koefelda, Seal Beach, and Roger S. Hsu, Torrance, all of Calif., assignors to Rehrig Pacific Company, Los Angeles, Calif.

Filed Sep. 21, 2000, Appl. No. 667,962
Int. Cl. B65D *6/00*
U.S. Cl. 220—669 **17 Claims**

1. A wall structure for a container, the wall structure comprising:

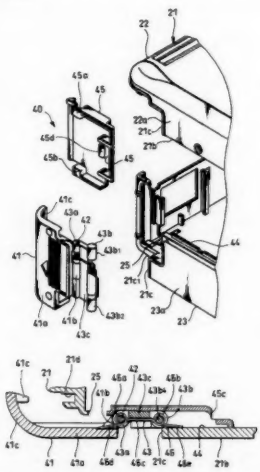


at least one band member extending at least partially across the length of the wall structure proximate an upper surface of the wall structure and oriented substantially parallel thereto, the at least one band member having a wave-like cross-section having a plurality of first peaks, adjacent and opposing second peaks, and inclined members extending between the plurality of first and second peaks, wherein the plurality of first peaks of the wave defines a first surface of the wall structure, and the opposing second peaks of the wave defines a second surface of the wall structure.

US 6,409,042 B1
CLOSURE OPENING/CLOSING APPARATUS OF ELECTRONICS AND ELECTRONIC APPARATUS HAVING THE SAME

Misao Hirano, Tokyo; Toshiaki Ueda, Saitama, and Hiroshi Shimada, Aichi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 23, 1999, Appl. No. 472,356
Claims priority, application Japan, Dec. 29, 1998, 10-377525
Int. Cl. H01M *2/10;* **H05K** *5/03;* **B65D** *43/16*
U.S. Cl. 220—812 **8 Claims**



1. A device for opening/closing a lid of an electronic apparatus, the device comprising:

a lid body for opening/closing an opening disposed on a hardware housing of said electronic apparatus;

a slide hinge interposed between said hardware housing and said lid body and including first and second hinge portions in parallel to each other with a flat portion formed therebetween; and

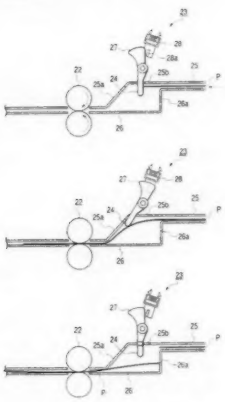
a hinge holder formed of an inner surface of said hardware housing and a rebound leaf spaced apart from said inner surface so that said slide hinge is slidably supported thereby, said slide hinge being rotatably attached to said lid body at said first hinge portion by a shaft attaching said slide hinge and said lid body and said second hinge portion includes columnar end portions arranged so as to be slidably and rotatably held by said hinge holder, wherein

said lid body is rotated in two steps with respect to said hardware housing by a rotation of said first and second hinge portions due to sliding of said slide hinge in said hinge holder and opens so as to overlap on an outside of said hardware housing in a reversed state.

US 6,409,043 B1
SHEET CONVEYING APPARATUS

Takashi Fujita, Shizuoka-ken, and Shigeo Doi, Numazu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1999, Appl. No. 419,094
Claims priority, application Japan, Oct. 19, 1998, 10-296575; Jan. 6, 1999, 11-001491
Int. Cl. B65H *5/00*
U.S. Cl. 221—10.03 **19 Claims**



1. A sheet conveying apparatus comprising:

a sheet feeding means for separating and feeding stacked sheets one by one;

a convey guide means for guiding the sheet fed out by said sheet feeding means;

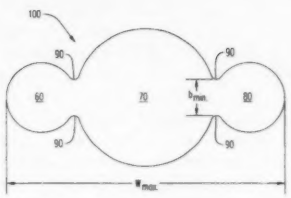
a spacing means provided on said guide means that deviates positions of a trailing end of a preceding sheet and a leading end of a succeeding sheet which is fed continuously to the preceding sheet; and

a sheet detecting means for detecting the leading end of the succeeding sheet deviated from the trailing end of the preceding sheet by said spacing means.

US 6,409,044 B1
DISPENSING ORIFICE

Jeffrey Brown, Ramsey; Cathy Durden, Midland Park, and Dane R Jackson, Bloomingdale, all of N.J., assignors to Playtex Products, Inc., Westport, Conn.

Filed Mar. 30, 2000, Appl. No. 538,811
Int. Cl. B65H *5/28*
U.S. Cl. 221—63 **19 Claims**

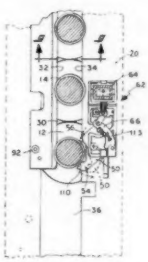


3. An orifice for dispensing a sheet, said orifice having at least one pair of opposing sides that define a maximum breadth for said orifice, wherein at least one of said pair of opposing sides has one or more nodules that extend a distance into said maximum breadth and thereby define a minimum breadth for said orifice, whereby the ratio of said minimum breadth to said distance is about 2:1 to about 8:1.

US 6,409,045 B1
VENDING MACHINE FOR BOTTLES

Thomas Robert Lauer, 12931 Shaker Blvd. Apt. 409, Cleveland, Ohio 44120

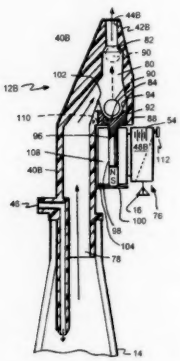
Continuation-in-part of application No. 09/121,925, filed on Jul. 24, 1998, now Pat. No. 6,112,943. This application Jul. 15, 2000, Appl. No. 616,325.
Int. Cl. B65G *59/00*
U.S. Cl. 221—124 **10 Claims**



1. A vending machine for vending a plurality of bottles each of which are supported in an upright position only at a top portion of each of the bottles comprising a storage cabinet, a dispensing rack located in said storage cabinet having at least a single elongated slot located therein for storing and dispensing bottles from said dispensing rack which bottles each include a top portion which is engaged by and supported by said slot in said dispensing rack, said slot including a pair of substantially parallel spaced apart side walls which terminate at one end thereof in an opening in said dispensing rack, said pair of substantially parallel spaced apart side walls being spaced apart a distance which is less than the diameter of the top portion of the bottles which are supported in said elongated slot to prevent bottles from falling from said elongated slot when the bottles are supported by said side walls of said slot, means for adjusting the distance between said parallel spaced apart side walls of said slot to enable said slot to support bottles having various diameters at the top portion of the bottles, said opening in said dispensing rack being larger than the diameter of the top portion of the bottles which are supported in said elongated slot to enable bottles which are supported in said elongated slot to move from said slot into said opening to be dispensed from said dispensing rack, said dispensing rack being inclined from a horizontal position in a downwardly direction toward said opening in said dispensing rack to enable bottles supported in said slot in said rack to move under the influence of gravity toward said one end of said slot at which said opening is located, a gate member for controlling movement of the bottles through said slot to said opening, said gate member being pivotable between a blocking position in which said gate member blocks movement of bottles from said slot to said opening and a dispensing position in which said gate member enables the next bottle to be vended to move from said slot to said

opening to be dispensed from said dispensing rack, a locking mechanism for locking said gate member to prevent said gate member from pivoting from said blocking position, and a crediting mechanism connected to said locking mechanism to unlock said locking mechanism when coins or a credit of a predetermined value are received in said crediting mechanism and said crediting mechanism is actuated to unlock said locking mechanism to allow said gate member to pivot from said blocking position to said dispensing position to enable the next bottle to be vended to move from said slot to said opening to be dispensed from said dispensing rack.

US 6,409,046 B1
METHODS OF DISPENSING LIQUIDS FROM POURING HEADS
Arganious E. Peckels, Kanabec County, Minn., assignor to Arganious E. Peckels, Ogilvie, Minn.
Continuation-in-part of application No. 08/143,567, filed on Oct. 26, 1993, now Pat. No. 5,505,349, which is a continuation-in-part of application No. 07/672,054, filed on Mar. 18, 1991, now Pat. No. 5,255,819, which is a continuation-in-part of application No. 07/477,553, filed on Feb. 9, 1990, now Pat. No. 5,044,521. This application Jun. 7, 1995, Appl. No. 484,554.
Int. Cl. B67D *5/22*
U.S. Cl. 222—1 **10 Claims**



7. A method of dispensing a plurality of predetermined quantities of liquid from a bottle, comprising the steps of

a) connecting a pouring head to a bottle of liquid;

b) inverting the connected head and bottle and pouring liquid from the bottle and out of the head;

c) sensing that pouring of liquid has commenced;

d) timing a period of dispensing;

e) electromagnetically releasing a magnetically responsive valve to close the head and terminate liquid dispensing, upon expiration of the time period, given one predetermined quantity of dispensed liquid;

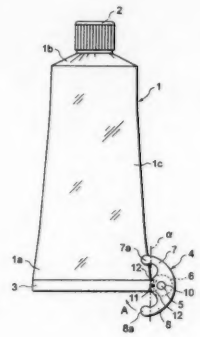
f) vertically shaking the inverted head and bottle; and causing the valve to jump upward in the head;

g) magnetically latching the valve during the vertical shaking of the head and bottle;

h) electronically sensing that the bottle and head are inverted and that the valve is magnetically latched; and

i) electronically re-starting the timer to pour a subsequent predetermined quantity of liquid from the bottle.

US 6,409,047 B1
TUBE SQUEEZER
Mamoru Tanaka, 175 W. 72nd St., #4H, New York, N.Y. 10023
Filed Jun. 5, 2001, Appl. No. 874,584
Int. Cl. B65D *35/32*
U.S. Cl. 222—99 **8 Claims**



1. A tube squeezer comprising:

a tube having a closed one end along a length direction, and another end from which a material contained therein can be discharged;

a frame mounted integrally on one end of the tube along a width direction, for holding the one end of the tube; and

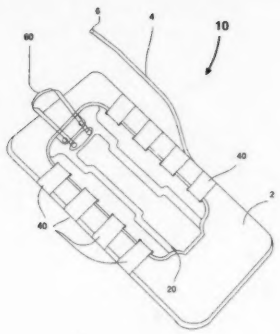
a handle having a main body mounted on the frame with two arms which extend out from the main body, each arm having a tip end portion which can abut vertically on a surface of the tube when the handle is rotated, wherein the main body projects outwards of the tube in the width direction, so that a user can hold the main body when rolling up the tube by the frame, and the arms extend from the main body such that a tip end portion of one arm overlaps with a part of the tube, thus the tip end portion can be engaged with a surface of the tube when the tube is rolled up to prevent the reverse of the rolled tube and the main body is adapted to be rotated in a direction where an overlapping section between one arm and the tube increases, whereby when the handle is rotated so that the tip end portion of one of the arms abuts on the surface of the tube, the tip end portion of the other arm moves outwards from a line along an outer side of the tube.

US 6,409,048 B1
PRESSURIZING DEVICE FOR A PERSONAL HYDRATION SYSTEM
Gregory L. Belzeski, 340 Old Saybrook, Boise, Id. 83706
Filed May 15, 2001, Appl. No. 858,317
Int. Cl. B65D *35/28*
U.S. Cl. 222—103 **21 Claims**

20. A pressurizing device for a personal hydration system having a hydration bladder, said pressurizing device comprising:

a flexible compression plate for contacting said hydration bladder, wherein said compression plate further comprises at least one stiffener for stiffening said compression plate, wherein said compression plate is generally rectangular in shape, having first and second ends defining a length therebetween and first and second sides defining a width therebetween;

a rigid stiffener means attaching to said compression plate, wherein said rigid stiffener means comprises an elongated center stiffener, said center stiffener generally centered within said compression plate and extending along the length of said compression plate, wherein said rigid stiffener means comprises first and second side stiffeners, said first side stiffener adjacent said compression plate first side, said second side stiffener adjacent said compression plate second side, wherein said first side stiffener and said second side stiffener further



comprises at least one retaining band attachment for allowing said retaining band to attach to said compression plate; and

at least one retaining band for holding said compression plate in contact with said hydration bladder, said retaining band further comprising a fastener.

US 6,409,049 B1

DEVICE AND A METHOD FOR ATTACHING A DISPENSER MEMBER TO A RECEPTACLE

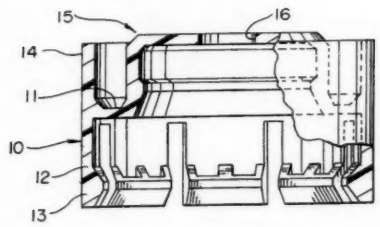
Olivier de Pous, Paris, and Yannic Hermouet, Le Pecq, both of France, assignors to Valois of America, Inc., Greenwich, Conn.

Continuation of application No. 09/099,684, filed on Jun. 18, 1998, now Pat. No. 6,186,359, which is a division of application No. 08/725,934, filed on Oct. 7, 1996, now Pat. No. 5,799,810, which is a division of application No. 08/311,041, filed on Sep. 22, 1994, now Pat. No. 5,562,219. This application Sep. 1, 2000, Appl. No. 654,018.

This patent is subject to a terminal disclaimer.

Int. Cl. B65D *47/34*

U.S. Cl. 222—153.09 **1 Claim**



1. A fixing ring for fixing a dispenser member on a neck of a receptacle containing a substance to be dispensed, said fixing ring being annular and comprising (1) a bottom portion for fixing said ring to said neck, and (2) a top portion including an opening for receiving the dispenser member to hold it on the container neck, said bottom portion having an exterior peripheral surface, and said top portion including at least one guide wail element extending vertically parallel to die longitudinal, central axis of said ring and extending around the periphery of said fixing ring substantially in line with said exterior peripheral surface of said bottom portion, said guide wall element being a continuous annular crown.

US 6,409,050 B1

LIQUID DISPENSER FOR DISPENSING FOAM

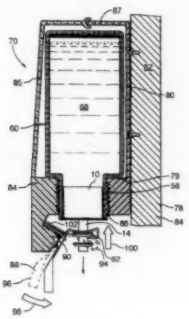
Heiner Ophardt, Vineland, Canada, and Ali Mirbach, Issum, Del., assignors to Hygiene-Technik Inc., Beamsville, Canada

Filed Oct. 1, 2001, Appl. No. 965,821

Claims priority, application Canada, Mar. 20, 2001, 2341659

Int. Cl. B67D *5/06*

U.S. Cl. 222—181.1 **17 Claims**



1. A pump for dispensing liquid from a reservoir comprising:

a piston chamber-forming member having an inner cylindrical chamber and an outer cylindrical chamber each having a diameter, a chamber wall, an inner end and an outer end;

the diameter of the inner chamber being less than the diameter of the outer chamber,

the inner chamber and outer chamber being coaxial with the outer end of the inner chamber opening into the outer chamber;

an inner end of the inner chamber in fluid communication with the reservoir;

a piston-forming element received in the piston chamber-forming member axially slidable inwardly and outwardly therein between an outward extended position and an inward retracted position;

the piston-forming element having an axially extending hollow stem having a central passageway closed at an inner end and having an outlet proximate an outer end;

an inner disk on the stem extending radially outwardly from the stem adapted to engage to the chamber wall of the inner chamber;

an intermediate disk on the stem extending radially outwardly from the stem adapted to engage the chamber wall of the inner chamber, the intermediate disk spaced axially outwardly from the inner disk relative the inner end of the stem;

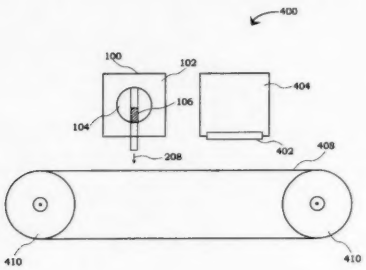
an outer disk on the stem spaced axially outwardly from the intermediate disk and extending radially outwardly from the stem into engagement with the chamber wall of the outer chamber to prevent fluid flow outwardly therebetween;

a first inlet located on the stem between the outer disk and the intermediate disk in communication with the passageway;

in the retracted position, the intermediate disk is received in the inner chamber to prevent fluid flow from the outer end of the inner chamber outwardly therepast and the inner disk does not prevent fluid flow between the reservoir and the inner chamber therepast via the inner end of the inner chamber;

in the extended position, the inner disk is received in the inner chamber to prevent fluid flow from the inner end of the inner chamber inwardly therepast and the intermediate disk does not prevent fluid flow between the inner chamber and the outer chamber via the outer end of the inner chamber.

US 6,409,051 B1
METHOD AND APPARATUS FOR DISPENSING A FLUID MEDIA
Glenn W. Travis, Sunnyvale, Calif., assignor to Lam Research Corporation, Fremont, Calif.
Filed Sep. 28, 2000, Appl. No. 675,085
Int. Cl. G01F *11/00*
U.S. Cl. 222—219 **20 Claims**



14. A fluid dispenser to be used in wafer processing operations, comprising:

a rotating element having a cylindrical bore with a first end and a second end, the rotating element being disk shaped and configured to rotate the first end and the second end;

a motorized device coupled to the rotating element;

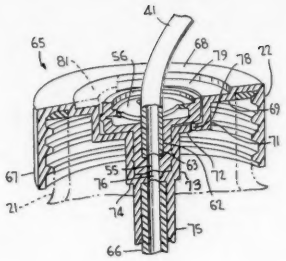
a housing having a fixed input port and a fixed output port, the housing being configured to enclose the rotating element, the first end and the second end of the rotating element being configured to intermittently switch between being aligned with the fixed input port and the fixed output port and being aligned with the fixed output poll and the fixed input port, respectively; and

a cylindrical piston contained within the cylindrical bore, the cylindrical piston having a length that is less than the cylindrical bore and is configured to switch from being closer to the fixed input port and the fixed output port;

wherein the cylindrical bore receives a liquid fluid from the fixed input port as the cylindrical piston moves toward the fixed output port and simultaneously dispenses the liquid fluid from the fixed output port, and the rotating element is configured to be rotated by the motorized device at a set rate to provide a substantially continuous flow of the liquid fluid, and the apparatus is implemented for controllably dispensing the liquid fluid onto one of a wafer surface, a wafer scrub brush, and a CMP polishing pad.

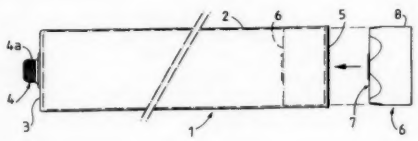
US 6,409,052 B1
TRIGGER SPRAYER DISPENSING SYSTEM
Jacques J. Barriac, Lee's Summit, Mo.; Joseph Krestine, Leawood, Kans., and Steven L. Sweeton, Lee's Summit, Mo., assignors to Saint-Gobain Calmar Inc., City of Industry, Calif.
Division of application No. 09/709,445, filed on Nov. 13, 2000. This application Feb. 12, 2002, Appl. No. 72,897.
Int. Cl. B67D *5/40*
U.S. Cl. 222—383.3 **4 Claims**

1. An assembly for connecting a flexible hollow fluid delivery tube to a rigid dip tube for a liquid sprayer, comprising a container closure having a cylindrical side wall which includes means for engaging a neck of the container, the closure having an upper end wall of stepped configuration comprising a first inner annular wall depending from said end wall, a second inner annular wall of a reduced diameter compared to that of said first wall, an annular base wall interconnecting said first and second inner walls, said second wall having a bottom wall with a central opening, and a depending sleeve on said bottom wall for suspending the dip tube,



the first, second and base walls defining a stepped well for the reception of a flexible tube adaptor.

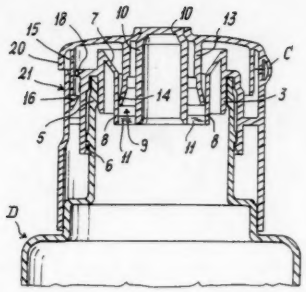
US 6,409,053 B2
PISTON FOR CLOSING A CARTRIDGE
Willy Stössel, Aesch, Switzerland, assignor to Stebler & Co. AG, Nunningen, Switzerland
Filed Dec. 21, 2000, Appl. No. 746,629
Claims priority, application Switzerland, Jan. 11, 2000, 46/00
Int. Cl. B67D *5/42*
U.S. Cl. 222—386 **7 Claims**



1. A cylindrical piston for insertion into a cylindrical container part of a cartridge for holding a flowable material, the piston comprising a cylindrical side wall having an external diameter at least equal to an internal diameter of the cylindrical container part of the cartridge so that the piston can be pressed into the cylindrical container part with a tight fit; an end wall closing the cylindrical side wall at one end of the cylindrical side wall; and at least one bevel extending from the end wall to a surface of the cylindrical side wall, the bevel forming, together with a cylindrical wall of the cylindrical container part, for a short time, a passage through which air can escape when the air is displaced upon the piston being pressed into the cylindrical container part, and a cylindrical wall section, which has the at least one bevel, having a length equal to at least one fourth (¼) and not more than two third (β) of an entire length of the side cylindrical wall.

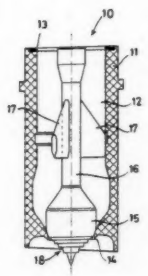
US 6,409,054 B1
POURER CAP WITH CLOSURE COVER
Angelo Garibaldi, Colnago, Italy, assignor to Capsol Berry Plastics SpA, Colnago, Italy
Filed Nov. 29, 2001, Appl. No. 995,600
Claims priority, application Italy, Dec. 1, 2000, MI00A2607
Int. Cl. B65D *47/06*
U.S. Cl. 222—524 **3 Claims**

1. A pourer cap with closure cover for fluid substance containers, comprising a main body having an upper part and a lower part and a cover joined thereto by a flexible tang, all formed in one piece by moulding plastic material, in which the main body delimits a discharge channel and presents, in its lower part, a seat for housing and sealingly retaining the free edge of the neck of a fluid substance container, the main body and the cover having respective profiled portions mutually cooperating to retain the cover on the upper part of the main body to close said discharge channel, wherein the main body comprises a funnel-shaped wall which is



inclined towards the bottom of said body and from which there extends a tubular wall which defines said discharge channel by combination with the opposing surface of an appendix supported on the inside of the tubular wall by at least one fin projecting from said tubular wall, the appendix having a free end projecting towards the top of the main body beyond said funnel-shaped wall, in the cover there being provided a delivery hole about the whole of which there extends an elongate annular jacket the free end of which is shaped as an outwardly diverging lip and is insertable and movable within said discharge channel to seal against said tubular wall of the main body, the delivery hole of the cover being superposed on and sealed by the free end of said appendix when in the closure position in which the cover is lowered onto the main body, the cover and main body being provided with profiled elements which mutually cooperate to limit the raising of the cover from the main body into the dispensing position in which the delivery hole of the cover is raised away from the free end of said appendix.

US 6,409,055 B1
FILLING VALVE
Arthur Everardus Officier, Bunnik, Netherlands, assignor to Stork Bottling Systems B.V., Raamsdonksveer, Netherlands
Filed Nov. 4, 1999, Appl. No. 434,868
Claims priority, application Netherlands, Nov. 16, 1998, 1010562
Int. Cl. B65D *47/00*
U.S. Cl. 222—559 **6 Claims**



1. Filling valve for metered delivery of a flow of medium, comprising:

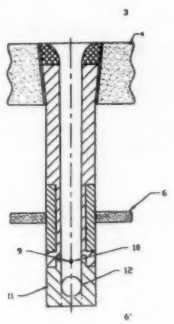
a valve housing with a passage having an inlet opening at the top and having an outlet opening at the bottom, said passage being coaxial with said inlet opening and said outlet opening; and

a valve body which is accommodated in the passage, a lower end of which has a diameter which decreases in the downwards direction and an upper end of which is connected to actuation means for vertical displacement of the valve body between a closed position and an open position of the valve, which respectively serve to block and allow through a flow of medium via the passage, through the outlet opening;

wherein a bottom section, which in the closed position projects out of the passage, of the lower end of the valve body is of stepped form, with a diameter which decreases in the downwards direction;

wherein substantially axial surface sections of the step shape run obliquely downwards at an acute angle of inclination (α) towards the center axis of the valve body.

US 6,409,056 B1
REFRACTORY PRODUCT
Stephen John Lee, Cardross, United Kingdom, assignor to Didier-Werke AG, Germany
Filed Mar. 17, 2000, Appl. No. 528,772
Claims priority, application United Kingdom, Mar. 17, 1999, 9906116
Int. Cl. B22D *35/00*
U.S. Cl. 222—606 **5 Claims**



1. A refractory shroud device having an internal bore for through passage of molten metal, said device comprising, a body defining at least a portion of said bore, and having sufficient length to allow an end thereof to become immersed in a melt under normal operation conditions, and operationally engageable with said end, but not screwed, a replaceable segment defining outlet means in flow communication with said bore, the replaceable segment having an internal profile adapted to provide a control over the flow of molten metal from the device, wherein said replaceable segment is retained in said body by a push fit mechanism and wherein a joint between said end of the body and the replaceable segment is arranged such that the joint is immersed in the melt.

US 6,409,057 B1
GARMENT HANGER WITH SIZE WINDOW
Ock Sung Kim, 20600 Homestead Rd. #14E, Cupertino, Calif. 95014
Filed Dec. 5, 2000, Appl. No. 729,681
Int. Cl. A47G *25/14*
U.S. Cl. 223—85 **3 Claims**

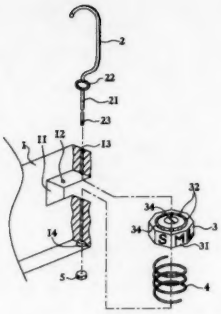
1. Garment hanger with window displaying size of the garment having:

A polygon shaped size indicator unit with different size representations written on each side of the polygon, including by not limited to XS, S, M, L, XL, 2, 3, 4 and the like;

A window opening located at the base hanger where said indicating unit is displayed;

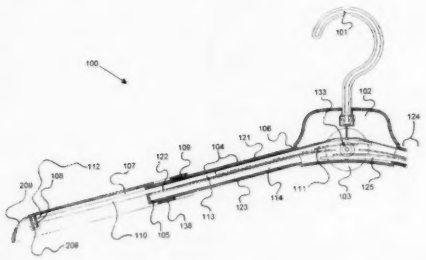
A means for manually turning said indicator unit according to the different garments that are hung;

A means for keeping said indicator unit at fixed position in order to display a certain size by the use of female and male



coupling parts that, by force of a spring pushing them against each other, lock into place.

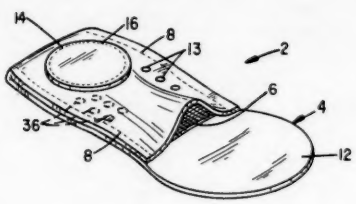
US 6,409,058 B1
ADJUSTABLE GARMENT HANGER
Peter Ar-Fu Lam, 20104 Wayne Ave., Torrance, Calif. 90503, and Andrew Y. K. Siu, 1532 Stanford Ave., Redondo Beach, Calif. 90278
Filed Oct. 26, 2000, Appl. No. 699,071
Int. Cl. A47G *25/44*
U.S. Cl. 223—94 **30 Claims**



1. A garment hanger having a medial portion;
first and second supporting arms extending in opposite direction from said medial portion;
first and second movable arms configured to travel along said first and second supporting arms for defining an adjustable garment supporting width; each of said movable arms having a remote region remote from said medial portion and a proximal terminal closer to said medial portion; and
first and second linkage tongues, each having a remote end connected to a remote region of said movable arms and a proximal region coupled to the medial portion of said hanger for adjusting the position of said movable arms.

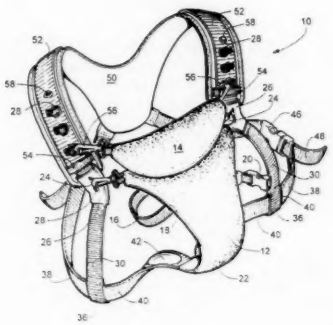
US 6,409,059 B1
HAND AND FINGER THIMBLES
Nathaniel Calvert, 3102 Crescent La. NW., Rochester, Minn. 55903
Filed Jan. 11, 2001, Appl. No. 758,847
Int. Cl. D05B *91/04*
U.S. Cl. 223—101 **16 Claims**

1. A thimble comprising:
a) a first pliable body member folded upon itself and hemmed to form an elongated envelope surrounding an interior cavity and wherein said cavity is sized to mount over the end phalanx of a finger;



b) an elastic member secured interiorly of said cavity to the hem that forms said cavity; and
c) a second pliable member secured to said body member and including an elastomer material applied as a patterned coating to an exterior surface of said second pliable member.

US 6,409,060 B2
CHILD CARRIER WITH ENHANCED BACK AND SHOULDER SUPPORT AND RETRACTABLE INFANT SEAT
Michael T. Donine, 43218 Business Park Dr., No. 108, Temecula, Calif. 92590
Provisional application No. 60/171,458, filed on Dec. 22, 1999.
This application Dec. 22, 2000, Appl. No. 745,601.
Int. Cl. A61G *1/00*
U.S. Cl. 224—160 **16 Claims**



1. A storage pocket and insert seat for use in combination with a child carrier having a body support panel supported by shoulder straps at a top portion and attached to the user at a bottom point on the body support panel comprising:
a storage pocket formed into said body support panel said storage pocket having at least one aperture providing access thereto;
said infant insert seat having a first half deployable from storage in said storage pocket and the second half deployable from storage in said storage pocket;
means of attachment of said first half of said infant insert seat to said second half of said infant insert seat to form said infant insert seat, whereby the user may store the infant insert seat in said storage cavity until needed and deploy it therefrom for use and later be able to return it thereto for storage when not needed.

US 6,409,061 B1

HOLDING DEVICE FOR A BEVERAGE CONTAINER

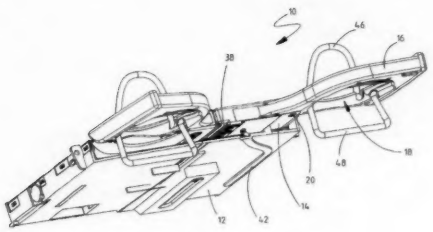
Heinz Fischer, Waldachtal; Ulrich Nienhaus, Nagold, and Michaela Aigner, Boeblingen, all of Germany, assignors to Fischerwerke Artur Fischer GmbH & Co. KG, Waldachtal, Germany

Filed Aug. 14, 2000, Appl. No. 638,117

Claims priority, application Germany, Sep. 18, 1999, 199 44 817

Int. Cl. B60R *7/00*

U.S. Cl. 224—281 **5 Claims**



1. A holding device for a beverage container, installable in a motor vehicle, the holding device comprising a carriage displaceably guided from an inserted position into a pivoted-out position in a manner of a drawer; a sliding guide element which displaceably guides said carriage between said positions; a holder having an insertion opening for an insertion of a beverage container, said holder being pivotably mounted on said carriage; a pivotal joint through which said holder is pivotally mounted on said carriage, said holder being so mounted on said carriage as to be pivotable through approximately 90° to a side so that in said pivoted-out position said holder is located substantially at said side next to said carriage; at least one support for a beverage container inserted in said holder, said support being pivotably mounted on said holder and having a laterally projecting pivotal shaft about which said support is pivotable, said pivotable shaft having a threaded surface; and a slide member mounted on said holder and driven by a pivoting movement of said holder, said slide member sliding along said threaded surface of said pivotal shaft and pivoting said support.

US 6,409,062 B1

LOAD CARRIER STRUT AND A METHOD FOR ITS MANUFACTURE

Anders Lundgren, Grimsås; Jan-Ivar Arvidsson, and Håkan Thulin, both of Hillerstorp, all of Sweden, assignors to Industri AB Thule, Sweden

Continuation of application No. 08/983,423, filed on Jan. 2, 1998, now abandoned, which is a continuation of application No. PCT/SE96/00735, filed on Jun. 4, 1996. This application Feb. 29, 2000, Appl. No. 515,477.

Claims priority, application Sweden, Jul. 6, 1995, 9502455

Int. Cl. B60R *9/04*

U.S. Cl. 224—309 **22 Claims**

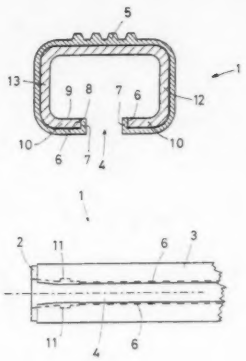
1. A method of manufacturing a load carrier strut adapted to be secured to a vehicle rood, said method comprising:

providing a load carrier strut having a slot with an opening extending into an interior portion of said load carrier strut, said slot opening being formed by at least one defining edge;

covering said load carrier strut with a protective skin;

extending a portion of said protective skin over said slot thereby covering at least a portion of said at least one defining edge of said slot; and

opening said portion of said protective skin extending into said slot thereby opening said interior portion of said load carrier



strut through said slot and said protective skin for accepting an engageable member.

US 6,409,063 B1

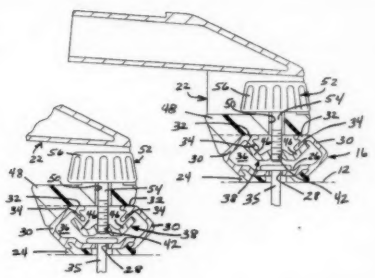
VEHICLE ARTICLE CARRIER HAVING ANGLED TAP PLATE AND COOPERATING SLAT

Gerard J. Kmita, Allen Park; Milton J. Antonick, Royal Oak, and Brett J. Borella, Bloomfield Hills, all of Mich., assignors to JAC Products, Inc., Ann Arbor, Mich.

Filed Oct. 20, 2000, Appl. No. 693,763

Int. Cl. B60R *9/045*

U.S. Cl. 224—321 **17 Claims**



1. For a vehicle article carrier having a locking element, a support rail adapted to be supported on or above an outer body surface of a vehicle, said support rail comprising:

an elongated support rail having a bottom wall and a pair of side walls forming an elongated channel;

a pair of flanges respectively extending from each of said side walls inwardly toward said elongated channel; and

a tap plate having a pair of angled ends each extending at an angle so as to be generally flush with said flanges when said angled ends are in contact with said flanges, such that said angled ends tend to draw said flanges toward each other when said tap plate is urged into a locked orientation by said locking element.

US 6,409,064 B1

LOCKING TOOL BOX

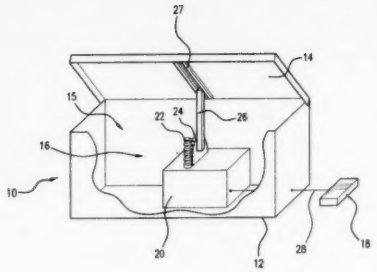
Jason S. Bayley, 7 Rowan Dr., Aliso Viejo, Calif. 92656

Filed Sep. 13, 2000, Appl. No. 660,609

Int. Cl. B60R *9/00*

U.S. Cl. 224—404 **11 Claims**

1. A tool box comprising:



a container having at least one lid, said lid being openable and closeable; and

mechanized means for opening and closing the lid, said means for opening and closing the lid being actuated by control means, said control means comprising a wireless remote control for a switch operatively attached to the means for opening and closing the lid.

US 6,409,065 B1

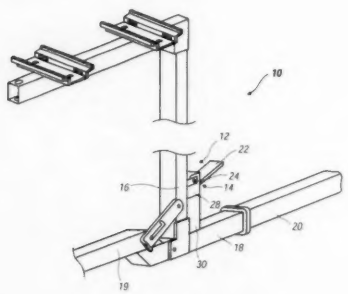
LATCHING HITCH MOUNT CARRIER

Jeffrey R. Edgerly, Bristol, Conn., assignor to Industri AB Thule, Sweden

Continuation of application No. 09/537,784, filed on Mar. 29, 2000, Provisional application No. 60/127,644, filed on Apr. 2, 1999. This application Aug. 30, 2000, Appl. No. 650,717.

Int. Cl. B60R *9/06*

U.S. Cl. 224—508 **7 Claims**



1. A coupling for attaching a carrier frame to a mounting stinger received in a receiving type hitch, said coupling comprising:

a hitch mount having a base and a sidewall, said sidewall having a slot formed therein and an edge, said slot having an open end at said edge, said base securely held to said mounting stinger;

a support tube having a bracket attached thereto, said bracket including a lock pin to slidably engage said slot in said sidewall to couple said support tube to said hitch mount; and

a latch pivotally mounted adjacent said sidewall, said latch having an open position to allow said lock pin to enter said open end of said slot at said edge of said sidewall, said latch further having a closed position to prevent release of said lock pin from said slot, said coupling formed between said hitch mount and said support tube with said lock pin in said slot and said latch in said closed position.

US 6,409,066 B1

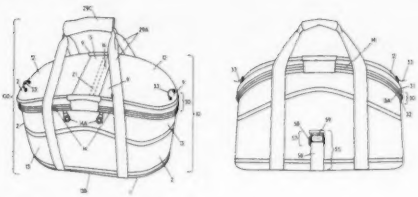
TOTE-BAG COOLER

Rachel Schneider; Terry A. Mears, both of Wichita, Kans., and James T. Sener, Glastonbury, Conn., assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Jul. 31, 2000, Appl. No. 629,600

Int. Cl. A45C *15/00*

U.S. Cl. 224—585 **20 Claims**



1. A flexible, closeable insulated container comprising:

a sidewall having a top edge and a bottom edge;

a bottom side attached to the bottom edge of the sidewall;

a top side attached to the top edge of the sidewall; and

at least one strap attached to the container such that the container may be suspended by the at least one strap;

the top side including two overlapping flaps formed by a first flap and a second flap, each of the first flap and the second flap being attached to and extending inward from the top edge, the overlapping flaps creating a self-sealing, sleeve-style aperture between the first flap and the second flap, the aperture providing access to at least one chamber delimited by the sidewall, the bottom side and the top side; and,

the sidewall, the bottom side and the top side each having an inner surface and an outer surface, an insulating material being disposed between the inner surface and the outer surface of each of the sidewall, the bottom side and the top side.

US 6,409,067 B1

STEP-BY-STEP RECOVERY OF A STRIP

Vincent Huret, Domaine de Montgarny, Route de Terny, 02880 Margival, France

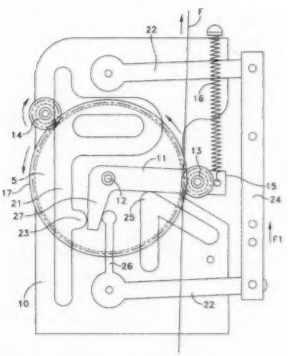
PCT No. PCT/FR99/02398, § 371 Date Sep. 1, 2000, § 102(e) Date Sep. 1, 2000, PCT Pub. No. WO00/20313, PCT Pub. Date Apr. 13, 2000

PCT Filed Jul. 10, 1999, Appl. No. 581,014

Claims priority, application France, Oct. 7, 1998, 98 12546; May 12, 1999, 99 06073

Int. Cl. B65H *20/00*; **B65B** *3/04*

U.S. Cl. 226—160 **3 Claims**



1. A device for evacuation of a strip carrying components after the components have been removed from the strip by a machine, the device comprising:

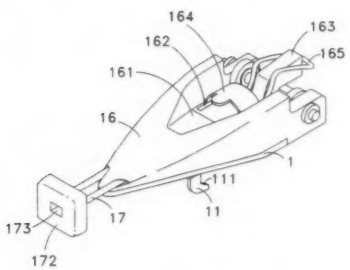
a clamp member for driving the strip with a stepping motion, the clamp member being synchronized by a coupling with the machine, and entraining and pushing the film step by step into a storage cavity, wherein the clamp member comprises two toothed wheels that are engaged together, one of the toothed wheels being mounted to rotate on a plate and a second of the toothed wheels being mounted to rotate on a bell-crank that pivots about a pin of said second of the toothed wheels, wherein the strip is clamped at a position along the strip between portions of said toothed wheels for driving the strip, wherein the toothed wheels are each rotatable in one direction only, whereby the position between the toothed wheels is advanced relative to the strip as one of said toothed wheels rotates, and the strip advances as the other of said toothed wheels rotates.

US 6,409,068 B1

QUICK DETACHABLE FASTENER COVER STRUCTURE FOR FASTENING TOOL

Yun Chung Lee, No. 181, Shin-Yi Rd., Ba-Li Shiang, Taipei Hsien, Taiwan

Filed Nov. 21, 2001, Appl. No. 996,428
Int. Cl. B25C *1/04*
U.S. Cl. 227—123 **5 Claims**



1. A quick detachable fastener cover structure for a fastening tool comprising a cover plate, a housing, a guide plate and a hook seat, wherein:

said cover plate is provided on one end thereof with hooks having oblique surfaces, and on the other end thereof with a plurality of tenons;

said housing is fixed on said cover plate, and is provided on one end thereof with an engaging plate able to lay flat thereon, and is pivotally connected with a 'U' shaped locking hoop;

said guide plate is mounted between a head and a fastener cartridge of said fastening tool, and is provided on one end thereof with engaging portions having thereon oblique surfaces, said engaging portions correspond in position to said hooks on said cover plate;

said hook seat is mounted between said head of said fastening tool and said guide plate, and is provided thereon with slide grooves and a back hook to respectively receive said tenons and engage said locking hoop;

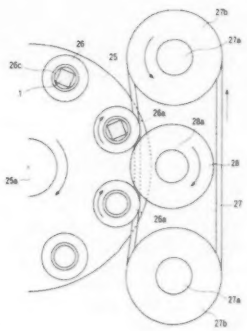
by combination the above components, a quick detachable fastener cover structure is formed of which said cover plate and said guide plate are adapted to fast and tight connecting with each other in a easy way.

US 6,409,069 B1

APPARATUS FOR MANUFACTURING UNIT ELEMENTS FOR CHIP COMPONENTS, AND CHIP COMPONENTS MOUNTING STRUCTURE

Shinichi Harada; Kiyoshi Tanbo; Sadaaki Kurata, all of Tokyo; Manabu Teraoka, and Ikuo Kakiuchi, both of Wakayama, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, and Chuki Seiki Co., Ltd., Wakayama, both of Japan

Division of application No. 08/960,368, filed on Oct. 29, 1997, now Pat. No. 6,070,787. This application May 9, 2000, Appl. No. 567,325.
Claims priority, application Japan, Oct. 31, 1996, 8-290436
Int. Cl. B23K *1/20*
U.S. Cl. 228—13 **13 Claims**



1. Apparatus for manufacturing a unit element of a chip component, the apparatus comprising:

a chuck for holding a prism-shaped base element in a predetermined orientation and for rotating said base element around its central axis or an axis parallel to its central axis;

a chuck wheel for translating said chuck so that a rotational axis of said chuck moves along a predetermined arcuate trajectory, the predetermined arcuate trajectory being in a plane substantial at right angles to the central axis while the chuck is holding the prism-shaped base element in the predetermined orientation; and

a grinding tool for grinding a center portion of said base element while the chuck is holding the base element and the chuck is rotating said base element and the chuck wheel is translating the chuck along the predetermined arcuate trajectory, said grinding tool being positioned and arranged for turning at a position adjoining the predetermined arcuate trajectory.

US 6,409,070 B1

MINIMIZING FLUX RESIDUE BY CONTROLLING AMOUNT OF MOISTURE DURING REFLOW

Raj N. Master; Mohammad Z. Khan; Maria G. Guardado, all of San Jose, Calif.; Diong Hing Ding, and Junaida Abu Bakar, both of Penag, Malaysia, assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

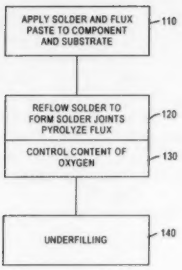
Provisional application No. 60/214,780, filed on Jun. 28, 2000. This application Sep. 18, 2000, Appl. No. 663,939.
Int. Cl. B23K *31/02*
U.S. Cl. 228—102 **14 Claims**

1. A method of manufacturing a semiconductor device by attaching a component to a substrate using solder, comprising the steps of:

a) applying flux to one of the component and the substrate;

b) heating the solder and the flux in a furnace with radiant heating to bond the component to the substrate; and

c) controlling moisture content of an atmosphere in the furnace surrounding the flux to below about 50 ppm; wherein



said moisture controlling step comprises the steps of measuring the moisture content in the furnace and providing a signal when the moisture content exceeds a threshold amount.

US 6,409,071 B1

METHOD FOR ASSEMBLING, BY WELDING, A COIL WITH AN INTEGRATED CIRCUIT OR AN ELECTRONIC UNIT OF SMALL DIMENSIONS

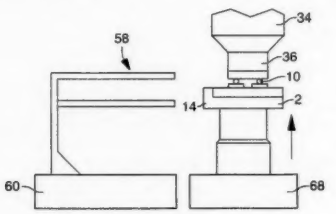
Elko Doering, Mörigen; Pascal Cattin, Cressier, and Uwe Thiemann, Gals, all of Switzerland, assignors to EM Microelectronic Marin SA, Marin, Switzerland

Filed Mar. 27, 2000, Appl. No. 534,983

Claims priority, application European Pat. Off., Mar. 31, 1999, 99106603

Int. Cl. B23K *20/12;31/02*

U.S. Cl. 228—110.1 **13 Claims**



1. A method for welding two end portions of a coil onto two electric contact pads or bumps of an integrated circuit or an electronic unit of small dimensions comprising the steps of:

supplying a coil comprising an electric wire at least partially coated with an insulating sheath, the coil having three main portions, the three main portions including a first end portion, a second end portion and a third portion, wherein the third portion is wound and defines a winding, and the first end portion and the second end portion are apart from the winding and define two end portions of the coil;

supplying an integrated circuit, or an electronic unit of small dimensions, having two electric contact pads or bumps;

arranging the two end portions respectively into position relative to the winding, wherein each respective position corresponds to a predetermined position appropriate for performing a welding step and at a certain distance from the electrical contact pads or bumps;

at least partially removing the insulating sheath of the coil from the two end portions in a preliminary step while the two end portions are in the predetermined position, wherein the step of partially removing the insulating sheath is carried out at two locations respectively the two end portions, each location of the two locations being a determined location on the coil relative to the winding; and

welding the two end portions onto the two electric contact pads or bumps.

US 6,409,072 B1

CHEMICAL MICROREACTORS AND METHOD FOR PRODUCING SAME

Norbert Breuer, Ditzingen, and Heinrich Meyer, Berlin, both of Germany, assignors to Atotech Deutschland GmbH, Berlin, Germany

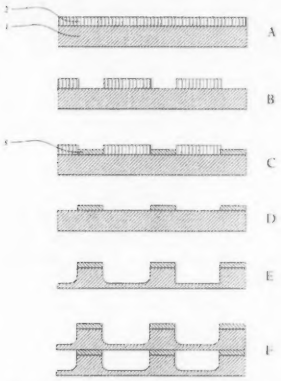
PCT No. PCT/DE98/00519, § 371 Date Oct. 25, 1999, § 102(e) Date Oct. 25, 1999, PCT Pub. No. WO98/37457, PCT Pub. Date Aug. 27, 1998

PCT Filed Feb. 17, 1998, Appl. No. 380,055

Claims priority, application Germany, Feb. 20, 1997, 197 08 472

Int. Cl. C03F *1/20*

U.S. Cl. 228—111.5 **21 Claims**



1. Manufacturing process for chemical microreactors including at least one substrate with a metal coating on at least one side thereof, the process forming fluid ducts as well as feeding and drain ducts for fluids, without using plastic molding techniques comprising the following steps of:

a.) coating with a resist layer in a pattern forming fluid duct structures for forming fluid ducts on a metal surface located on each substrate by layering means selected from a group consisting of photoresist layering and screen-printed varnish layering, so that the metal surfaces are partly covered by the resist coating layer;

b.) removing metal from each uncoated metal surface of each substrate by a process selected from the group consisting of electroless and electrochemical etching;

c.) totally removing the resist coating layer;

d.) forming solder layers by depositing metals that can form eutectics;

e.) superimposing each substrate and a closure segment closing the fluid ducts, and interconnecting each substrate and the closure segment by soldering.

US 6,409,073 B1

METHOD FOR TRANSFERING SOLDER TO A DEVICE AND/OR TESTING THE DEVICE

Kenneth Kaskoun; Erik Jung, and Werner Budweiser, all of Berlin, Germany, assignors to Fraunhofer-Gesellschaft Zur Foerderung der Angewandten Forschung E.V., Munich, Germany

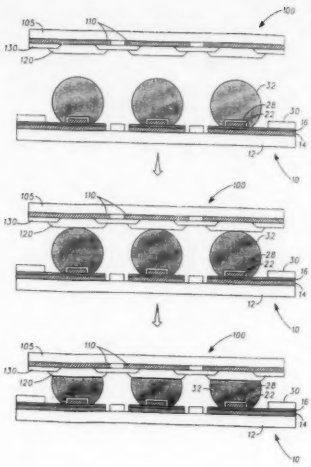
PCT No. PCT/EP99/05033, § 371 Date Feb. 27, 2001, § 102(e) Date Feb. 27, 2001, PCT Pub. No. WO00/04578, PCT Pub. Date Jan. 27, 2000

Continuation of application No. 09/116,140, filed on Jul. 15, 1998, now abandoned. This PCT application Jul. 14, 1999, Appl. No. 743,739.

Int. Cl. B23K *31/02*

U.S. Cl. 228—180.22 **10 Claims**

1. A method for transferring a solder to a receiving substrate comprising the steps of:



providing a transfer substrate, the transfer substrate having:

an insulating layer;

a conductive layer formed over the insulating layer, the conductive layer being non-wettable by the solder;

a solder receiving stud formed on the conductive layer, the solder receiving stud being formed of a conductive material which is wettable by the solder, the solder receiving stud having a first area; and

forming a solder bump on the solder receiving stud, by screen printing the solder onto the solder receiving stud to obtain screen printed solder, and reflowing the screen printed solder;

providing the receiving substrate, the receiving substrate having a solder accepting stud formed of a conductive material, the conductive material being wettable by the solder, the solder accepting stud having a second area which is greater than the first area;

making physical contact between the solder bump of the transfer substrate and the solder accepting stud of the receiving substrate while the solder bump is in a liquidus state; and

subsequently, separating the transfer substrate from the receiving substrate, leaving a majority of the solder bump on the solder accepting stud of the receiving substrate.

US 6,409,074 B1

FLUX COMPOSITIONS FOR BRAZING ALUMINUM, THEIR FILMS AND BRAZING METHOD

Haruzo Katoh; Takashi Watsuji, and Ken Matsumura, all of Osaka, Japan, assignors to Toyo Aluminium Kabushiki Kaisha, Osaka-fu, Japan

Division of application No. 09/373,542, filed on Aug. 13, 1999, now Pat. No. 6,203,628. This application Jul. 13, 2000, Appl. No. 616,079.

Claims priority, application Japan, Aug. 20, 1998, 10-234488; Aug. 27, 1998, 10-241663; Oct. 9, 1998, 10-288490; Jun. 7, 1999, 11-159887

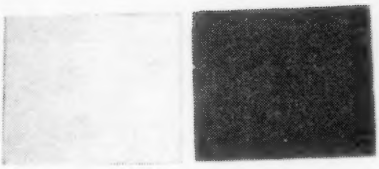
Int. Cl. B23K *31/02:35/34*

U.S. Cl. 228—223 **5 Claims**

1. A method of joining an aluminum material comprising:

(1) coating at least a part of an aluminum brazing sheet with a flux composition for brazing aluminum comprising (a) a fluoride flux, (b) at least one member selected from a butyl rubber having a molecular weight ranging from 250,000 to 550,000 and a petroleum resin, and (c) a solvent;

(2) drying; and



EXAMPLE I-1 COMPARATIVE EXAMPLE I-2

(3) joining the coated aluminum brazing sheet with the aluminum material by heating.

US 6,409,075 B1

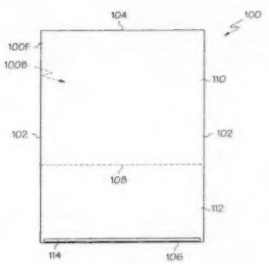
MAILER INTERMEDIATE

Rajendra Mehta, Centerville; Todd M. Pegler, Dayton; Stephen W. Henson, Centerville, and David E. Washburn, Kettering, all of Ohio, assignors to The Standard Register Company, Dayton, Ohio

Filed Oct. 4, 2000, Appl. No. 678,888

Int. Cl. B65D *27/00*

U.S. Cl. 229—92.1 **34 Claims**



1. A mailer intermediate comprising:

a sheet having a sheet face, a pair of longitudinal edges, and a first transverse fold line dividing said sheet into a first panel and a second panel;

said first panel having a first panel face, a first panel back, and a first transverse edge opposite said first transverse fold line;

said second panel having a second panel face, a second panel back, and a second transverse edge opposite said first transverse fold line;

a repositionable adhesive applied to said sheet face, wherein said sheet is folded along said first transverse fold line such that said second panel is releasably held against said first panel adjacent to said second transverse edge by said repositionable adhesive; and,

indicia applied to said sheet using a variable imaging printer while said second panel is releasably held to said first panel by said repositionable adhesive.

US 6,409,076 B1

COMBINATION STORAGE BOX

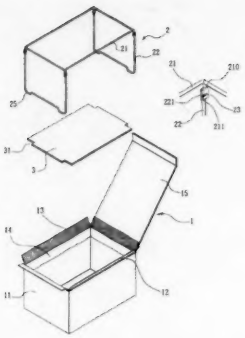
Wen-Tsan Wang, P.O. Box 82-144, Taipei, Taiwan

Filed Dec. 10, 2001, Appl. No. 6,149

Int. Cl. B65D *5/42*

U.S. Cl. 229—122.34 **1 Claim**

1. A combination storage box comprising a collapsible box body, said collapsible box body having a horizontal bottom panel and four upright peripheral side panels defining with said horizontal bottom panel a rectangular top-open holding space, a hard bottom plate fitted into said collapsible box body and supported on the



horizontal bottom panel of said collapsible box body, a folding collapsible support frame inserted into said collapsible box body to support said collapsible box body in shape, hook and loop materials fixedly provided in said collapsible box body and adapted for securing said folding collapsible support frame in position, wherein:

said bottom plate has four notches in four corners thereof;

said folding collapsible support frame comprises a rectangular open base frame, said rectangular open base frame comprising two pairs of downward lugs respectively downwardly extended from two distal ends of each of two opposite short sides thereof, said downward lugs each having a positioning groove, and two U-shaped foot frame bars respectively pivoted to said downward lugs and turned relative to said rectangular base open frame between a first position where said U-shaped foot frame bars are closely attached to said rectangular open base frame and a second position where said U-shaped foot frame bars are maintained perpendicular to said rectangular base frame and arranged in parallel, said U-shaped foot frame bars each comprising two engagement portions at two distal ends thereof adapted for engaging the positioning grooves of said downward lugs to hold said U-shaped foot frame bars in said second position and two protruded foot portions disposed at two ends of a transversely extended middle section thereof and adapted for engaging the notches of said bottom plate after insertion of said folding collapsible support frame into said collapsible box body to support said collapsible box body in shape.

US 6,409,077 B1

DISPLAY CARTON

Josephine Telesca, Trumbull, and Michael Edward Ross, Oxford, both of Conn., assignors to Unilever Home & Personal Care USA, division of Conopco, Inc., Greenwich, Conn.

Provisional application No. 60/202,944, filed on May 9, 2000. This application Nov. 15, 2000, Appl. No. 713,469.

Int. Cl. B65D *5/54*

U.S. Cl. 229—164 **7 Claims**

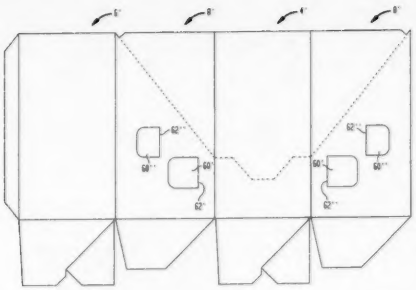
1. A display carton comprising:

opposing front and rear panels;

a floor defined by at least one panel;

a pair of opposing side panels;

the front, rear and side panels having walls of identical height as measured from the floor up to an upper edge of each of the respective panels, the panels forming a receiving cavity and the upper edges defining an open mouth, the side panels each including a tear-away section, one edge of each of the tear-away sections being coincident with the upper edge of the respective side panel and a diagonal edge in perforated attachment running transverse across each of the side panels, and the front panel including a tear-away section having one edge



coincident with the upper edge of the front panel and having an opposed edge in perforated attachment; and

at least two support tabs each of which are cut-out on at least one of the side panels, the support tabs being attached to the at least one of the side panels along a respective one of at least two hinge folds allowing the respective tab to be positioned within the cavity of the carton, the tabs being vertically offset in a staggered relationship one to the other.

US 6,409,078 B2

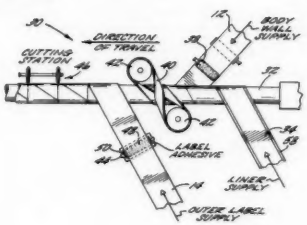
COMPOSITE CAN AND METHOD OF MAKING SAME

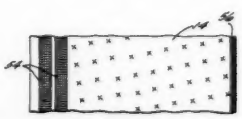
Krishnaraju Varadarajan, Florence, S.C., assignor to Sonoco Development, Inc., Hartsville, S.C.

Division of application No. 09/271,134, filed on Mar. 17, 1999, now Pat. No. 6,230,968. This application May 11, 2001, Appl. No. 853,258.

Int. Cl. B65D *3/26*

U.S. Cl. 229—202 **2 Claims**





1. A composite can, comprising:

a body wall constructed from one or more strips of paperboard wrapped about an axis of the can to form a tubular can body, the body wall having an outer surface defined by an outermost paperboard strip, the body wall having an inner surface defined by an innermost paperboard strip;

a cover layer covering the body wall with an inner surface of the cover layer confronting the outer surface of the body wall, the cover layer being adhered to the body wall by an adhesive which is applied in a predetermined pattern between the inner surface of the cover layer and the outer surface of the body wall, the pattern providing substantially less than 100 percent adhesive coverage of said surfaces; and

a liner covering the inner surface of the body wall and adhered thereto by an adhesive which is applied in a predetermined pattern such that the adhesive covers substantially less than 100 percent of the liner, wherein the cover layer and the liner each comprises a web-like strip spirally wound about the axis

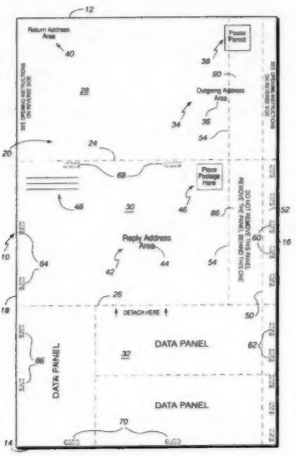
of the can body, and wherein the adhesive is applied in a continuous narrow stripe along an edge of at least one of the web-like strips for reducing the tendency of said edge to be lifted away from the body wall at a cut end of the can body said edge forms a helical joint along said body wall.

US 6,409,079 B1

PRINT-TO MAIL COMPATIBLE, TWO-WAY SELF-CONTAINED MAILER

Wilbur Hutchinson, St. George, Utah, assignor to Moore North America, Inc., Grand Island, N.Y.

Filed Jul. 5, 2001, Appl. No. 897,970
Int. Cl. B65D *27/06*
U.S. Cl. 229—305 **24 Claims**



1. An intermediate for a mailer type business form, comprising:

a quadrate sheet of paper having parallel top and bottom edges, parallel first and second side edges perpendicular to the top and bottom edges, and first and second faces;

first and second fold lines parallel to said top and bottom edges, and dividing said sheet into substantially equal size first, second, and third panels,

an outgoing address area being defined on said first face of said first panel, said outgoing address area being spaced from said first and second side edges;

a reply address area being defined on said first face of said second panel, said reply address area being spaced from said first and second side edges;

a remittance area being defined on said first face of said third panel;

first line of weakness formed in said first, second and third panels, parallel to and spaced from said first side edge, said first line of weakness defining a tear-off strip providing for ready opening of a mailer constructed by Z-folding said sheet about said fold lines;

first adhesive areas provided at least in said tear-off strip for holding said first through third panels together as an outgoing mailer when said sheet is Z-folded about said fold lines; and

second adhesive areas provided on said second face of said first and/or second panel for defining said first and second panels into a reply envelope that is substantially sealed along side and top and bottom edges thereof,

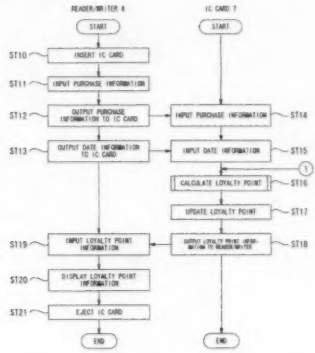
wherein said sheet of paper is free from a line of weakness adjacent and parallel to said second side edge, thereby to maximize an available space of said first, second and third panels for printed indicia and to define said reply envelope.

US 6,409,080 B2

PORTABLE ELECTRONIC DEVICE AND LOYALTY POINT SYSTEM

Toshiyuki Kawagishi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-Ken, Japan

Filed Feb. 21, 2001, Appl. No. 788,425
Claims priority, application Japan, Mar. 27, 2000, 2000-085994
Int. Cl. G06F *17/00*; **G06K** *5/00*
U.S. Cl. 235—375 **14 Claims**



1. A portable electronic device to execute a prescribed process according to information on a deal amount of money input from a terminal device comprising:

storage means for storing an application program for calculating loyalty points, and individual information of a person holding the portable electronic device, a qualification unit to add a special loyalty point based on the individual information, a size of a loyalty point added that corresponds to the qualification unit and a total loyalty point calculated by the application program;

means for calculating a first loyalty point using the application program stored in the storage means according to the information on the deal amount of money input from the terminal device, a second loyalty point using the application program stored in the storage means according to the corresponding qualification unit when the qualification unit is satisfied, and a total loyalty point by adding the second loyalty point with the first loyalty point; and

means for updating the loyalty point stored in the storage means to the total loyalty point calculated by the calculating means.

US 6,409,081 B1

APPARATUS AND METHOD FOR OPERATING A CHECKOUT SYSTEM HAVING AN ITEM SET-ASIDE SHELF WHICH IS MOVABLE BETWEEN A NUMBER OF SHELF POSITIONS

Paul F. Nugent, Jr., Alpharetta, Ga., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 2, 1999, Appl. No. 432,635
Int. Cl. G06K *15/00*
U.S. Cl. 235—383 **17 Claims**

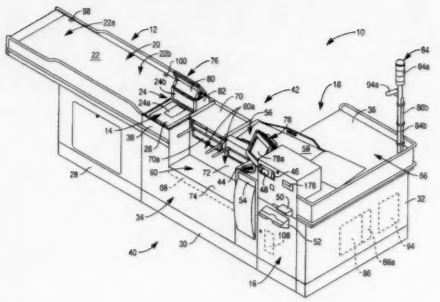
1. A method of operating a checkout terminal having a movable item shelf, comprising the steps of:

positioning said item shelf in an assisted shelf position;

operating said checkout terminal so as to perform an assisted retail function while said item shelf is positioned in said assisted shelf position;

moving said item shelf from said assisted shelf position to a self-service shelf position; and

operating said checkout terminal so as to perform a self-service retail function while said item shelf is positioned in said self-service shelf position,



wherein said checkout terminal further has (i) an assisted bagwell having a first overhead access opening for advancing a first item into a first container positioned in said assisted bagwell, and (ii) a self-service bagwell having a second overhead access opening for advancing a second item into a second container positioned in said self-service bagwell,

wherein said step of positioning said item shelf in said assisted shelf position includes the step of positioning said item shelf so as to (i) expose said first overhead access opening of said assisted bagwell, and (ii) cover said second overhead access opening of said self-service bagwell, and

wherein said step of positioning said item shelf in said self-service shelf position includes the step of positioning said item shelf so as to (i) expose said second overhead access opening of said self-service bagwell, and (ii) cover said first overhead access opening of said assisted bagwell.

US 6,409,082 B1

TRACKING OF PRODUCTS

Roelof Daniel Jacobus Davis, and Frederick Jacobus Rabe, both of Gauteng, South Africa, assignors to Perseu Administration (Proprietary) Limited

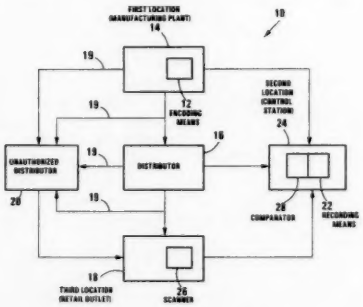
PCT No. PCT/US98/15058, § 371 Date Feb. 11, 2000, § 102(e) Date Feb. 11, 2000, PCT Pub. No. WO99/05627, PCT Pub. Date Feb. 4, 1999

PCT Filed Jul. 22, 1998, Appl. No. 463,526

Claims priority, application South Africa, Jul. 25, 1997, 97/6663

Int. Cl. G06F *17/60*

U.S. Cl. 235—385 **19 Claims**



1. A method of detecting designated products from a number of sources, the method including the steps of:

applying a unique code to each one of a plurality of products at a first location;

designating certain of the products;

compiling a list of codes of said designated products;

transmitting said list of codes of said designated products to a central loss control station at a second location;

recording said designated codes at the central loss control station;

reading the codes of a multiplicity of products at a third location;

transmitting said codes of said products at said third location to said central loss control station;

comparing said codes received from said third location with said codes recorded at the central loss control station; and

triggering an alarm at the central loss control station if any of the codes of the products at said third location match the codes of the designated products.

US 6,409,083 B1

SAFETY SWITCH

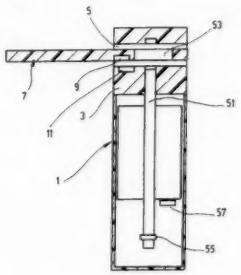
Walter Link, Rutesheim, Germany, assignor to Euchner GmbH & Co., Leinfelden-Echterdingen, Germany

PCT No. PCT/EP97/07302, § 371 Date Jun. 1, 1999, § 102(e) Date Jun. 1, 1999, PCT Pub. No. WO98/43351, PCT Pub. Date Oct. 1, 1998

PCT Filed Dec. 24, 1997, Appl. No. 319,042

Int. Cl. G06K *7/08*

U.S. Cl. 235—449 **15 Claims**



1. A safety switch for monitoring movable protection devices, comprising:

a switching member having at least one reading head;

an operation actuating element movable relative to said reading head and interacting with said reading head without contacting said reading head, said actuating element having an inductive reactance for interacting with said reading head and an electronic code in a first storage specifically identifying said actuating element; and

an evaluation device connected at an output of said reading head, including an electronic code in at least two second storages specifically identifying one of said reading head and said switching member, and including at least two sets of components for analyzing and evaluating signals from said reading head.

US 6,409,084 B1

POS SYSTEM

Motoko Umeta, Tokyo, Japan, assignor to NEC Infrontia Corporation, Japan

Filed Jun. 28, 2000, Appl. No. 605,241

Claims priority, application Japan, Jun. 29, 1999, 11-184318

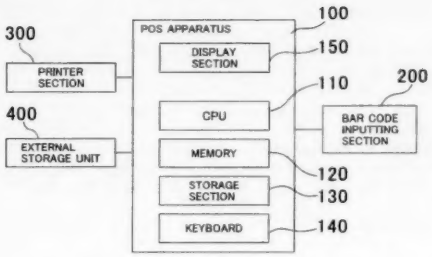
Int. Cl. G06K *7/10*

U.S. Cl. 235—462.01 **6 Claims**

1. A POS system, comprising:

a bar code production apparatus for producing a bar code which includes discount information of a commodity; and

a POS apparatus for reading information of the bar code produced by said bar code production apparatus and performing settlement processing based on the read information;



said bar code production apparatus including bar code reading means for reading a bar code of a commodity before the commodity is discounted, discount money amount inputting means for inputting a discount amount of money for the commodity whose bar code has been read by said bar code reading means, bar code production means for producing a bar code which includes the pre-discount commodity information and the discount money amount information based on the bar code read by said bar code reading means and the discount money amount inputted by said discount money amount inputting means, and bar code outputting means for outputting the bar code produced by said bar code production means;

said POS apparatus including POS bar code reading means for reading a bar code, bar code discrimination means for discriminating whether or not the bar code read by said POS bar code reading means has been produced by said bar code production means of said bar code production apparatus and includes discount information, price calculation means for calculating, if it is discriminated by said bar code discrimination means that the bar code read by said bar code reading means includes discount money amount information, a post-discount price of the commodity based on information of the read bar code, and price outputting means for outputting the post-discount price calculated by said price calculation means together with the pre-discount price.

US 6,409,085 B1

METHOD OF RECOGNIZING PRODUCE ITEMS USING CHECKOUT FREQUENCY

Yeming Gu, Suwanee, Ga., assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 16, 2000, Appl. No. 640,032

Int. Cl. G06K *7/10*

U.S. Cl. 235—462.11 **7 Claims**

1. A method of identifying a produce item comprising the steps of:

(a) collecting produce data from the produce item;

(b) determining DML values between the produce data and reference produce data for a plurality of types of produce items;

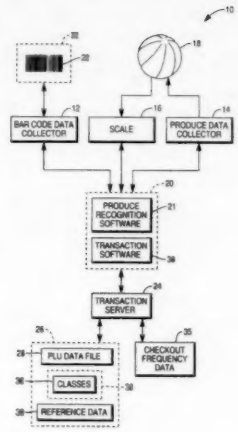
(c) determining conditional probability densities for all of the types of produce items using the DML values;

(d) combining the conditional probability densities together to form a combined conditional probability density;

(e) determining checkout frequencies for the produce types;

(f) determining probabilities for the types of produce items from the combined conditional probability density and the checkout frequencies;

(f) determining a number of candidate identifications from the probabilities; and



(g) identifying the produce item from the number candidate identifications.

US 6,409,086 B1

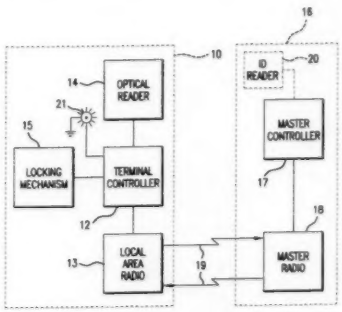
TERMINAL LOCKING SYSTEM

John Pellaumail, Wargrave, United Kingdom; Thomas Roslak, Eastport, N.Y.; David Cole, Swindon, United Kingdom; Jerome Swartz, Old Field, N.Y., and Robert Beach, Los Altos, Calif., assignors to Symbol Technolgies, Inc., Holtsville, N.Y.

Continuation-in-part of application No. 08/907,785, filed on Aug. 8, 1997. This application Nov. 12, 1998, Appl. No. 190,485.

Int. Cl. G06K *7/10;15/00*

U.S. Cl. 235—462.13 **14 Claims**



1. A system for distributing one of a plurality of terminals to an authorized customer for self service shopping, said system comprising:

a) a customer identification controller for identifying a customer authorized to use the self-shopping system;

b) a terminal including communication means for receiving an authorization for removal, a rack removal detector, and an alarm mechanism for activating an alarm upon unauthorized removal;

c) a terminal receiving rack having terminal receiving positions arranged to engage said terminal; and

d) a terminal dispensing controller for generating and communicating the authorization for removal command to the terminal, whereby the terminal is released to the authorized customer without activating the alarm mechanism.

US 6,409,087 B1

SCANNING AND DETECTION MEANS

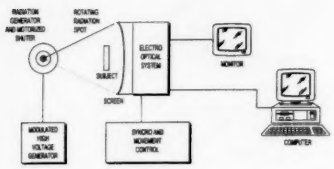
Pier Giovanni Menci; Romano Menci, both of Anagni; Pier Luigi Caprioli, Rome, and Mauro Di Tomassi, Frosinone, all of Italy, assignors to Europa Trading, s.r.l., Italy

Filed Apr. 15, 1999, Appl. No. 293,641

Claims priority, application European Pat. Off., Apr. 15, 1998, 98106782

Int. Cl. G06K *7/10*

U.S. Cl. 235—468 10 Claims



1. A scanning and detection device comprising:

a radiation source emitting radiation onto an object to be scanned;

a detection screen comprising fluorescent elements converting incident radiation of said radiation source into different fluorescent radiation, wherein said fluorescent elements are selected from the group of inorganic elements and organic elements.

US 6,409,088 B1

SCANNING DEVICE FOR CAPTURING IMAGES

Valery Alekseevich Klevtsov, Demakova, Russian Federation, assignor to Nauchno-Tekhnicheskykkooperativ (Vector), Demakova, Russian Federation

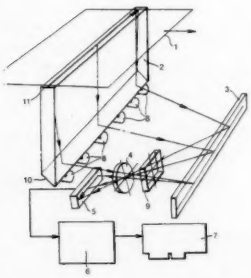
PCT No. PCT/GB98/02997, § 371 Date Mar. 13, 2000, § 102(e) Date Mar. 13, 2000, PCT Pub. No. WO99/18536, PCT Pub. Date Apr. 15, 1999

PCT Filed Oct. 7, 1998, Appl. No. 486,190

Claims priority, application Russian Federation, Oct. 7, 1997, 97116442

Int. Cl. G06K *7/10*

U.S. Cl. 235—473 8 Claims



1. A scanning device for capturing images, which contains an optical unit comprising a light source, a light guide, and a light receiver, wherein the light guide comprises a substantially parallel sided, transparent member, the transparent member having opposite ends extending between the parallel sides, one of the ends facing the light source and extending non-orthogonally between the parallel sides, other end facing the image to be scanned in use whereby light from the light source enters the light guide through the one end, is directed onto the image after passing out of the other end, is reflected back into the light guide and then directed by the light guide towards the light receiver.

US 6,409,089 B1

METHOD FOR PROTECTING THE AUDIO/VISUAL DATA ACROSS THE NRSS INTERFACE

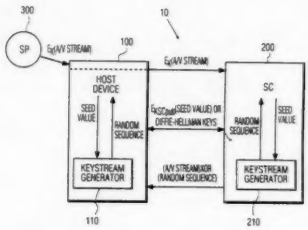
Ahmet Mursit Eskicioglu, Indianapolis, Ind., assignor to Thomson Licensing S.A., Boulogne-Cedex, France

PCT No. PCT/US98/26296, § 371 Date Mar. 13, 2001, § 102(e) Date Mar. 13, 2001, PCT Pub. No. WO99/30499, PCT Pub. Date Jun. 17, 1999

Provisional application No. 60/069,090, filed on Dec. 10, 1997, Provisional application No. 60/086,567, filed on May 21, 1998. This PCT application Dec. 10, 1998, Appl. No. 581,276.

Int. Cl. G06K *19/06*

U.S. Cl. 235—492 19 Claims



1. A method for protecting the output audio/visual stream of a smart card comprises the steps of:

(a) receiving a scrambled signal from a source external to said smart card;

(b) generating a descrambling key in response to said received signal;

(c) descrambling said received signal using said descrambling key to generate a descrambled signal;

(d) receiving data from said external source;

(e) generating a scrambling key in response to said received data;

(f) scrambling said descrambled signal using said scrambling key to generate a rescrambled signal; and,

(g) providing said rescrambled signal to said external source.

US 6,409,090 B1

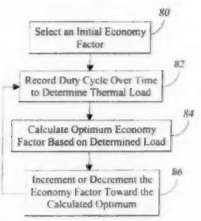
SELF-OPTIMIZING DEVICE FOR CONTROLLING A HEATING SYSTEM

David L. Gilvar, Weston, Mass.; Steven G. Landry, Brookline, and Steven P. Harter, Merrimack, both of N.H., assignors to Microtherm LLC, Wellesley, Mass.

Filed May 18, 2000, Appl. No. 572,878

Int. Cl. G05D *23/00*

U.S. Cl. 237—2 A 24 Claims


80
Select an Initial Economy Factor
82
Record Duty Cycle Over Time to Determine Thermal Load
84
Calculate Optimum Economy Factor Based on Determined Load
86
Increment or Decrement the Economy Factor Toward the Calculated Optimum

1. An apparatus for controlling a heating unit, the heating unit employing a heating medium that is heated by the heating unit and which transfers heat into an ambient atmosphere outside of the heating unit, the heating unit having an on-state initiated when a characteristic of the heating medium representative of the heating capacity of the medium decreases below a minimum level, and an off-state initiated when the characteristic of the heating medium reaches a maximum level, the apparatus comprising:

an input element for receiving a signal from a sensor, the signal indicating the heating medium characteristic representative of the heating capacity of the heating medium;

an output element for signaling the heating unit to begin its on-state;

a time-measuring element for measuring an off-time, the off-time being the length of time from initiation of the off-state of the heating unit until the characteristic of the heating medium decreases below the minimum level; and

a processor for determining a delay time and for signaling the heating unit to delay initiation of the on-state by the delay time amount, the delay resulting in an energy savings over an undelayed initiation, the processor further comprising an auto-calibration processor which tests at least one delay time and calculates an energy savings index for each delay time tested, then calculates an optimum energy savings delay time.

US 6,409,091 B1

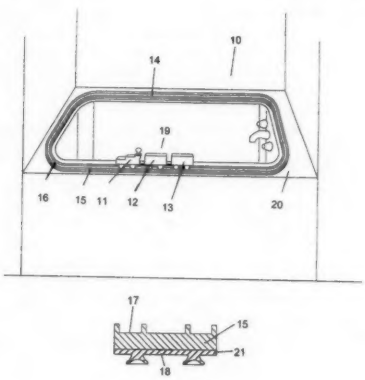
TOY RAILROAD TRACK FOR USE ON A BATHTUB

Richard E. Simpson, 32 Ellis Ct., Pleasant Hill, Calif. 94523

Continuation-in-part of application No. 09/133,756, filed on Jan. 9, 1998, now abandoned. This application Feb. 2, 2000, Appl. No. 496,678.

Int. Cl. E01B *23/00*

U.S. Cl. 238—10 A **5 Claims**



1. For use with a toy train being formed by a toy engine and a plurality of cars, a toy railroad track, attached to a bathtub, comprising:

a. a plurality of straight and curved track sections each of which has a top surface and a bottom surface and which are configured to be coupled together to form said toy railroad track; and

b. a plurality of straight and curved layers each of which has a shape corresponding one of said straight and curved track sections, respectively, and has a top surface and a bottom surface with said bottom surface having a plurality of suction cups disposed thereon and said top surface being coupled to said bottom surface of one of said straight and curved track sections, respectively, said suction cups securely coupled to a peripheral surface of the bathtub in order for the toy train to ride on said top surface of said toy railroad track.

US 6,409,092 B1

SUPERSTRUCTURE CONSTRUCTION

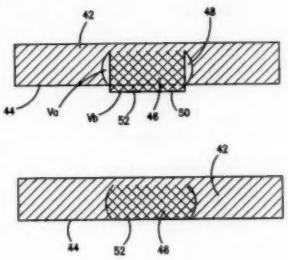
Albrecht Demmig, Kirchmoser; Hans-Ulrich Dietze, Wusterwitz; Hubertus Hohne, and Sebastian Benenowski, both of Butzbach, all of Germany, assignors to BWG Butzbacher Weichenbau GmbH & Co. KG, Butzbach, Germany

Continuation of application No. 09/051,476, filed as application No. PCT/EP96/04536, filed on Oct. 18, 1996, now Pat. No. 6,027,034. This application Jan. 10, 2000, Appl. No. 479,932.

Claims priority, application Germany, Oct. 20, 1995, 195 39 144; Nov. 25, 1995, 195 44 055

Int. Cl. E01B *9/00*

U.S. Cl. 238—382 **17 Claims**



1. A superstructure arrangement for a track comprising:

a rail (**18**, **20**, **26**) fastened to a securing device (**16**) which is disposed above a sleeper (**10**) and at least one intermediate layer (**36**, **38**, **40**) extending between the sleeper and the securing device, the rail having a maximum permissible stress;

wherein the intermediate layer has a rigidity x such that at the maximum permissible stress in the rail by bending generated in response to wheel load, the intermediate layer has a substantially non-elastic property, so that further bending of the rail under additional load causes only insubstantial additional stress in said rail.

US 6,409,093 B2

AUTOMATED ELECTRONICALLY CONTROLLED MICROSPRAYER

Michael J. Ulczynski, Riverview; Brian L. Wright, Mason, and James Ray Miller, Williamston, all of Mich., assignors to Board of Trustees of Michigan State University, East Lansing, Mich.

Continuation of application No. 09/415,509, filed on Oct. 8, 1999, now Pat. No. 6,182,904, which is a continuation-in-part of application No. 08/841,429, filed on Apr. 22, 1997, now Pat. No. 5,964,403. This application Jan. 15, 2001, Appl. No. 761,071.

This patent is subject to a terminal disclaimer.

Int. Cl. B05B *17/00;* **A01G** *27/00*

U.S. Cl. 239—1 **19 Claims**

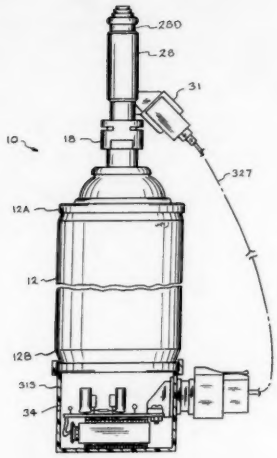
17. A dispenser apparatus for periodic controlled dispensing of a chemical in a liquid form which comprises:

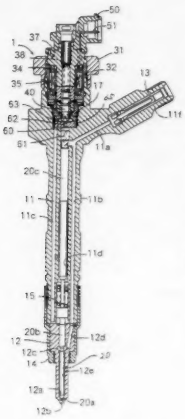
(a) a sealed container having an orifice which allows a pressurized gas to be provided in the container, the container being configured to hold the pressurized gas and the chemical in the liquid form;

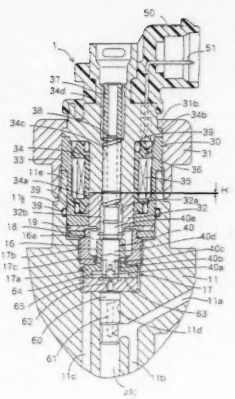
(b) adaptor means configured to be sealingly connected to the orifice;

(c) a nozzle sealingly connected to the adaptor means for the dispensing wherein a sidewall of the adaptor means surrounding the cavity has a slot extending through the sidewall into the cavity and wherein a lock ring is slid through the slot to engage the body of the nozzle to secure the nozzle in the cavity of the adaptor means, wherein the nozzle comprises:

(i) a body with a passage therethrough;







(ii) a valve moveable in the passage of the body to open and close the passage;

(iii) a solenoid coil with electrical leads to the coil mounted on the body, so that the coil provides a continuous circuit to the valve which is moved upon application of a current through the coil; and

(iv) a bias means mounted in the body which holds the valve in a closed position when the current is not applied through the coil; and

(d) a control means for supplying current to the coil to move the valve against the bias means to open the passage in the body of the nozzle and allows the chemical in the liquid form to be dispensed periodically from the container through the passage in the body of the nozzle, wherein the control means is a self-contained circuit which is connected to the nozzle and supplies the current periodically to the coil on a pre-programmed schedule, wherein the control means is controlled by an electromagnetic wave transmitter controlling a receiver connected to the coil of the nozzle on the container which control means when activated by the transmitter, allows current to flow to the coil thus moving the valve to open the passage in the nozzle.

US 6,409,094 B2

STRUCTURE OF FUEL INJECTOR ADJUSTABLE IN FUEL JET CHARACTERISTIC

Senta Tojo; Tetsuya Toyao, both of Kariya; Teruaki Yamaguchi, Anjo, and Motoichi Murakami, Susono, all of Japan, assignors to Denso Corporation, Kariya, and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Mar. 9, 2001, Appl. No. 801,817

Claims priority, application Japan, Mar. 13, 2000, 2000-068754

Int. Cl. F02D *1/06*

U.S. Cl. 239—5 **29 Claims**

1. A fuel injector comprising:

a nozzle having formed therein a spray hole from which fuel is sprayed;

a nozzle valve selectively opening and closing the spray hole;

an injector body supporting therein said nozzle valve slidably, said injector body having formed therein a fuel sump supplied with the fuel from an inlet formed in said injector body to produce fuel pressure urging said nozzle valve in a spray hole-opening direction, a pressure chamber supplied with the fuel from the inlet to produce fuel pressure urging said nozzle valve in a spray hole-closing direction, and a valve hole establishing fluid communication between the pressure chamber and a drain port formed in said injector body;

a control valve selectively opening and closing the valve hole formed in said injector body;

a first urging mechanism urging said control valve in a valve hole-closing direction for closing the valve hole to block the fluid communication between the pressure chamber and the drain port;

a control valve moving mechanism made up of a stationary portion and a movable portion, the stationary portion including a stator and a coil, the movable portion including an armature which is connected fixedly to said control valve and spaced from the stator through a given air gap, the coil being energized electrically to produce an attractive force through the stator for attracting the armature to move said control valve in a valve hole-opening direction, thereby opening the valve hole to establish the fluid communication between the pressure chamber and the drain port;

a second urging mechanism urging the stationary portion of said control valve moving mechanism in a first direction identical with the valve hole-opening direction; and

an air gap adjusting member disposed around the stationary portion of said control valve moving mechanism in engagement with said injector body so as to urge the stationary portion of said control valve moving mechanism in a second direction opposite the first direction against an urging pressure produced by said second urging mechanism to keep the air gap between the stator and the armature, said air gap adjusting member being designed to be movable selectively in said first direction and second direction for changing the air gap.

US 6,409,095 B2

GLASS BULB ATTACHMENT FOR DECORATIVE SPRINKLER

Courtney A. King, Ypsilanti, Mich., assignor to Bird Brain, Inc., Ypsilanti, Mich.

Continuation of application No. 09/625,155, filed on Jul. 25, 2000, now Pat. No. 6,202,937. This application Mar. 20, 2001, Appl. No. 812,612.

This patent is subject to a terminal disclaimer.

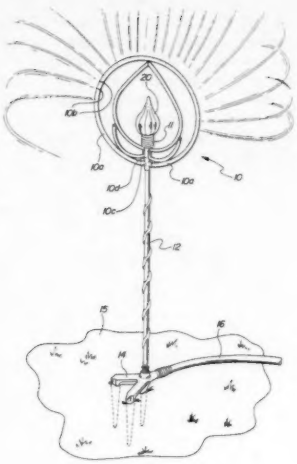
Int. Cl. B05B *17/08*

U.S. Cl. 239—17 **7 Claims**

1. In a standpipe type sprinkler having a sprinkler head which includes an upright member adapted to mount an ornament, an adapter arrangement for mounting a glass ornament to the upright member, comprising:

a glass ornament having a protruding base portion;

an adapter socket having an upper end sized to receive the base portion of the glass ornament, the upper end being perma-



nently fastened to the base portion of the glass ornament, and a lower end adapted to fit over the upright member on the sprinkler head, the lower end further including means for removably securing the adapter to an outer surface of the upright member.

US 6,409,096 B2

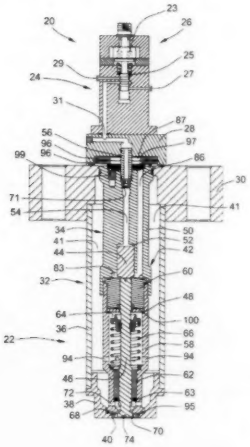
HYDRAULICALLY ACTUATED FUEL INJECTOR CARTRIDGE AND SYSTEM FOR HIGH PRESSURE GASEOUS FUEL INJECTION

Roger Popp, Woodland Park, Colo., assignor to Woodward Governor Company

Division of application No. 09/482,481, filed on Jan. 12, 2000, now Pat. No. 6,270,024. This application Jun. 15, 2001, Appl. No. 883,023.

Int. Cl. B05B *9/00*

U.S. Cl. 239—124 **20 Claims**



1. A fuel injector for injecting gaseous fuel into a cylinder of an engine, the fuel injector adapted to be driven by hydraulic signals of a hydraulic fluid, comprising:

a support housing having a gas passageway therein for communicating gaseous fuel to the cylinder of the engine;

a piston mounted in a piston control chamber actuated by the hydraulic signals;

a valve in the housing driven by the piston between open and closed positions corresponding with opening and closing the gas passageway to the cylinder of the engine;

a collection chamber in the support housing, hydraulic fluid adapted to leak past the piston into the collection chamber, leaked oil being communicated to an outlet for removal;

wherein the piston is mounted in the control chamber without seals, with a small clearance between the piston and the control chamber, a controlled amount of hydraulic fluid adapted to continuously leak past the piston; and

a gas seal between the valve and the support housing, the gas seal engaging the valve for preventing gaseous fuel from leaking from the gas passageway into the collection chamber, wherein the collection chamber provides a fail safe in which gas leakage past the gas seal is tolerated, any gas leakage being joined with leaked hydraulic fluid for removal and separation via the outlet.

US 6,409,097 B1

YARD BLOWER FOR DISTRIBUTING YARD CARE MATERIAL

William H. McCauley, 23 Abbeville St., Due West, S.C. 29639

Continuation-in-part of application No. 09/390,892, filed on Sep. 7, 1999, now abandoned, which is a division of application No. 09/090,854, filed on Jun. 4, 1998, now Pat. No. 5,947,384. This application Apr. 14, 2000, Appl. No. 549,769.

Int. Cl. B05B *15/00*

U.S. Cl. 239—289 **25 Claims**

1. Fogger apparatus for distributing a mist of liquid treatment materials comprising:

a portable blower for creating an airflow having an inlet and an outlet;

a handheld blower tube connected in fluid communication to the outlet of the blower though which said airflow is delivered, and said blower tube has an exit end through which the exiting airflow exits said blower tube;

an air control device carried by said blower tube for selectively controlling the airflow through said blower tube;

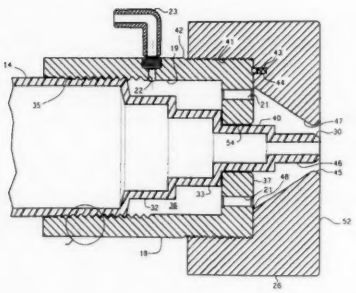
a container for containing a liquid material to be dispensed as a mist;

a feed tube connected to said container for delivering said liquid from said container;

a dispensing nozzle in fluid communication with said feed tube having a free end terminating near said exit end of said tube for distributing liquid material into said exiting air flow; and

a spray control device positioned on said feed tube and carried by said blower tube before said dispensing nozzle for controlling the characteristics of the mist formed by said liquid being injected into said exiting airflow.

US 6,409,098 B1
APPARATUS AND METHOD FOR SPRAYING SINGLE OR MULTI-COMPONENT MATERIAL
Russell H. Lewis, Rancho Santa Fe, and Mihai A. Solomon, San Diego, both of Calif., assignors to Rhino Linings USA, Inc., San Diego, Calif.
Continuation of application No. 09/451,323, filed on Nov. 30, 1999, now Pat. No. 6,250,567. This application Mar. 26, 2001, Appl. No. 816,451.
Int. Cl. B05B *1/30*
U.S. Cl. 239—292 **8 Claims**



1. A disposable spray tube for transporting a viscous material to a manifold having an interior surface and an exterior surface, the spray tube comprising:

a receptor end for receiving the viscous material;

a discharge end for discharging the viscous material; and

a body element disposed between the receptor end and the discharge end, the body element comprising:

a first portion with a first outer diameter;

a second portion connected with the first portion, the second portion having a second diameter, wherein the second diameter is smaller than the first diameter;

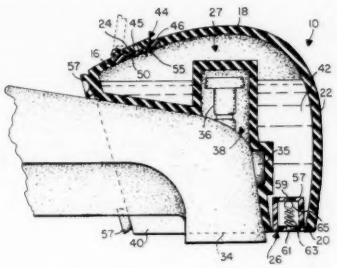
a third portion connected with the second portion, the third portion having a third diameter, wherein the third diameter is smaller than the first diameter;

wherein the first portion of the body element is configured to engage with an interior surface of the manifold and wherein the second portion of the body element is configured to be disengaged from the interior surface of the manifold when the first portion of the body element is engaged with the interior surface of the body element such that an air chamber is formed between the second portion of the body element and the interior surface of the manifold and;

wherein the third portion is configured to be disengaged from the interior surface of the manifold when the first portion of the body element is engaged with the interior surface of the body element such that an air chamber is formed between the third portion of the body element and the interior surface of the manifold; and

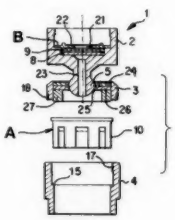
wherein the receptor end, the discharge end, and the body element comprise a single, non-jointed, disposable spray tube.

US 6,409,099 B1
FAUCET COVER AND DISPENSER
Sean K. Goodwin, and Janis R. Goodwin, both of 643 Sea Pine Cir., Pensacola, Fla. 32506
Continuation-in-part of application No. 09/459,690, filed on Dec. 13, 1999, now abandoned. This application Oct. 27, 2000, Appl. No. 696,954.
Int. Cl. A02C *5/02;* **B05B** *7/26;7/28*
U.S. Cl. 239—310 **18 Claims**



6. A faucet cover and dispenser, comprising: a resilient body formed of rubber and adapted for positioning over the end of a faucet, said resilient body having a pair of opposed side portions having upper and front ends, said upper ends being connected by a top portion, said front ends being connected by a front portion, each of said side, top and front portions being hollow and being in fluid communication with one another so as to form a liquid reservoir, said side, top and front portions being disposed so as to form a faucet-receiving chamber having access openings in the rear and bottom of said resilient body, said top portion being provided with a liquid inlet opening in fluid communication with said liquid reservoir and said front portion being provided with a liquid outlet opening in fluid communication with said liquid reservoir.

US 6,409,100 B1
ARTICULATED AIR ADMISSION DEVICE
Stig Lundberg, Halmstad, Sweden, assignor to Lundberg & Son V.V.S.-Produkter AB, Einskede, Sweden
Filed Oct. 6, 2000, Appl. No. 680,532
Claims priority, application Sweden, Oct. 7, 1999, 9903623
Int. Cl. B05B *7/00;15/08*
U.S. Cl. 239—428.5 **6 Claims**



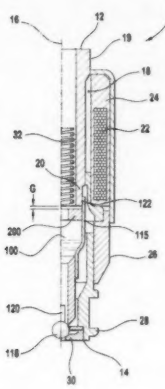
1. An articulated air admission device comprising a lower portion with a mixing means provided with a screen mounted in the device as a separate unit, a central portion, and an upper portion arranged to be attached to the outlet spout of a water tap, characterized in that the upper portion is provided with a joint ball facing towards and connected to the central portion which is connected to the lower portion by means of a thread and that a pressure limiting means comprising a flow limiting diaphragm, a toothed disk, and a screen, is disposed in the upper portion to reduce the water pressure before it reaches the joint ball.

US 6,409,101 B1

HOLLOW OVERSIZED TELESCOPIC NEEDLE WITH ARMATURE

Angelo D'Arrigo, Newport News, Va., assignor to Siemens Automotive Corporation, Auburn Hills, Mich.

Filed Jun. 30, 2000, Appl. No. 606,687
Int. Cl. B05B *1/30*
U.S. Cl. 239—585.1 **28 Claims**



1. A fuel injector comprising:

a hollow body having an upstream segment and a downstream segment; and

a valve having:

a needle assembly reciprocably mounted in the hollow body, the needle assembly including:

an upstream segment having:

a first longitudinal channel extending therethrough; and

a magnetic armature located within the first longitudinal channel, the armature including a passage extending therethrough; and

a downstream segment having:

a second longitudinal channel co-axial with and communicating with the first longitudinal channel, the second longitudinal channel extending therethrough;

a seating body located at a downstream end of the downstream segment; and

a transverse passage located upstream of the seating body, the transverse passage communicating with at least one of the first and the second longitudinal channels; and

a seat disposed downstream of the needle, the seating body being adapted to sealingly mate with the seat when the needle is in a closed position, wherein the downstream segment is connected to the upstream segment with a telescopic connection.

US 6,409,102 B1

FUEL INJECTOR ASSEMBLY

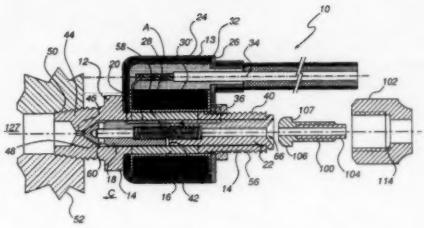
Jabe R. Luttrell, Burlington, and Donald G. Fortier, Torrington, both of Conn., assignors to Aerosance, Inc., Farmington, Conn.

Filed Mar. 15, 1999, Appl. No. 268,601
Int. Cl. F02M *51/00*
U.S. Cl. 239—585.4 **23 Claims**

1. A valve, comprising:

an inner housing of magnetically permeable material, said inner housing having an outlet port therein;

a stopper member of magnetically permeable material movably supported within said inner housing, said stopper member is an elongated, tubular member having a tapered head portion and a constant and continuous cross-section for the remaining length thereof;



a central housing member of non-magnetically permeable material received within said inner housing and adjacent at least a portion of said stopper member, wherein said inner housing and said central housing member define a passage in which said stopper member is received, said passage has a shape that substantially corresponds to said tapered head portion and constant and continuous cross-section of the remaining length thereof of said stopper member such that said stopper member is movably received within and substantially fills said passage; and

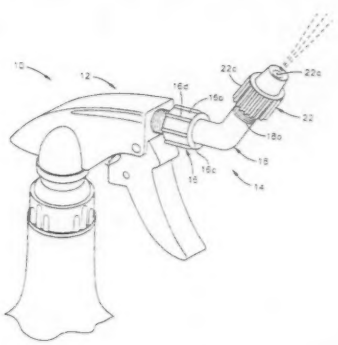
an electrically-energizeable coil adjacent said inner housing.

US 6,409,103 B1

360° ROTATIONAL DIRECTIONAL NOZZLE FOR TRIGGER SPRAYERS

John M. Norville, Madison, Wis., and James B. Caldwell, Sherman Oaks, Calif., assignors to 360 Enterprises, Sherman Oaks, Calif.

Filed Oct. 24, 2000, Appl. No. 695,686
Int. Cl. B05B *15/08;* **B67D** *5/40*
U.S. Cl. 239—587.1 **30 Claims**



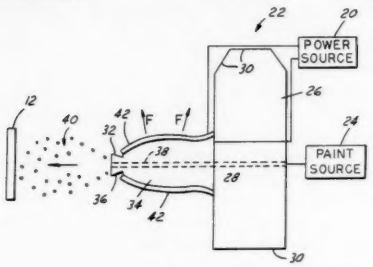
1. A sprayer nozzle assembly for dispensing a fluid in any desired direction from a fluid container, the container having a dispenser apparatus mounted thereto, the nozzle assembly comprising:

a rotatable conduit positioned downstream in a fluid flow relation to said dispenser apparatus, said rotatable conduit having an inlet end, a discharge end and a fluid passage, wherein an axis extending though said inlet end is at an angle with respect to an axis extending through said discharge end; and

a connector configured to connect said rotatable conduit to said dispenser apparatus in fluid flow relation;

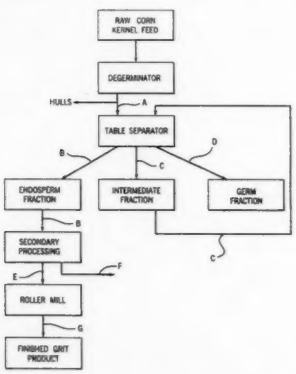
wherein the fluid can be dispensed in any desired direction by rotating said rotatable conduit with respect to the container.

US 6,409,104 B1
SILICON-DOPED AMORPHOUS CARBON COATING FOR PAINT BELL ATOMIZERS
Aaron Fiala, Newport; Jeffrey Petty, Livonia, and Timothy Jay Potter, Dearborn, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.
Filed Apr. 19, 2000, Appl. No. 552,132
Int. Cl. B05B *5/04;3/10*
U.S. Cl. 239—703 6 Claims



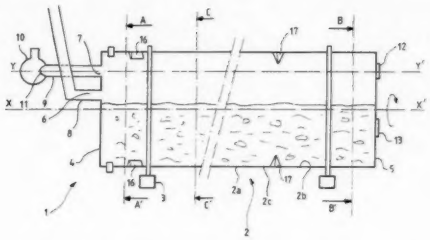
1. An improved bell atomizer for use in electrostatic applications having a bell housing and an aluminum bell cup, the improvement comprising:
a wear resistant coating formed on a surface of the aluminum bell cup, wherein said wear resistant coating comprises a silicon-doped amorphous carbon coating.

US 6,409,105 B1
CORN MILLING AND SEPARATING DEVICE AND METHOD
John Griebat, Cedar Rapids, Iowa, and Alan Koechner, Crystal Lake, Ill., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Aug. 19, 1999, Appl. No. 377,083
Int. Cl. B02C *9/04*
U.S. Cl. 241—7 41 Claims



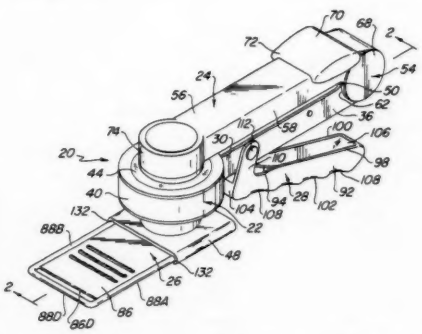
1. A method of separating degerminated corn comprising endosperm and germ components into endosperm and germ fraction output streams, said method comprising:
(a) supplying a feed stream of degerminated corn to a table separator; and
(b) separating the degerminated corn feed stream with the table separator to form at least two output streams comprising at least one endosperm fraction output stream having a predominant concentration of endosperm and at least one germ fraction output stream having a predominant concentration of germ.

US 6,409,106 B1
DRUM INTENDED FOR A MACHINE FOR PROCESSING WASTE AND A CORRESPONDING MACHINE
Jean-Pierre Levasseur, Impasse des Bouvreuils, and Bernard Combaneyre, allée Jean de la Fontaine, both of France, assignors to Vinci Environnement, Rueil Malmaison Cedex, France
Filed Jul. 24, 2000, Appl. No. 628,872
Claims priority, application France, Jul. 28, 1999, 99 09814
Int. Cl. B02C *17/20*
U.S. Cl. 241—57 16 Claims



1. A drum intended for a pre-processing and processing machine for household waste, commercial solid waste and non-hazardous industrial waste comprising:
an elongated rotating envelope comprising an external part and an internal part,
a fixed transversal inlet wall for the arrival of the waste to be processed located at an inlet of the drum and immobile relative to the rotating envelope, said wall comprising a first opening linked to a ventilator, and a second opening linked to a device for loading the waste.
a transversal outlet wall for the processed waste located at the outlet of the drum turning simultaneously with the rotating envelope,
wherein the rotating envelope comprises large cutters, small cutters, and points fixed so that they can be detached, and the transversal outlet wall comprises two openings one of which is situated in the upper half of the wall and the other in the lower half of the wall.

US 6,409,107 B1
HAND-HELD FOOD PROCESSOR
John J. Romano, 240 W. Third Ave., Conshohocken, Pa. 19428
Filed Oct. 17, 2000, Appl. No. 690,175
Int. Cl. A47J *43/25*
U.S. Cl. 241—94 17 Claims



1. A hand-held food processor device for selectively slicing or grating a foodstuff, said food processor device comprising a recep-

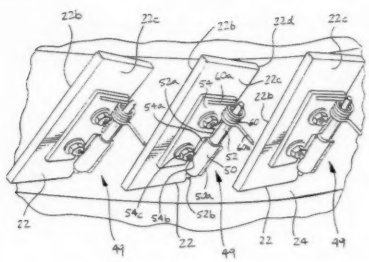
tacle member having a hollow cavity for receipt of the foodstuff, a pusher member for engaging the foodstuff to move the foodstuff, a cutting member for slicing or grating the foodstuff and an actuator for operating said cutting member, said receptacle member comprising a body portion having a first end and a second end, said hollow cavity being located at said second end and having a outlet, said cutting member being movably mounted adjacent said outlet, said pusher member having a first end pivotably connected to said first end of said receptacle member and a second end for engaging the foodstuff within said cavity to push a portion of the foodstuff out of said outlet, said actuator being arranged to cause said cutting member to move across said outlet into engagement with the portion of the foodstuff to slice or grate the portion of the foodstuff.

US 6,409,108 B1

DAMAGE-RESISTANT DEFLECTOR VANE

Rickey E. Wark, The Woodlands, Tex., and John Anthony Nardi, Clinton Twp., Mich., assignors to Sure Alloy Steel Corporation

Filed Dec. 22, 2000, Appl. No. 747,853
Int. Cl. B02C *15/00*
U.S. Cl. 241—119 **6 Claims**



1. In a coal mill pulverizer throat, a damage-resistant vane assembly comprising:

a deflectable vane mounted in the throat on a spring support, the spring support being designed to support the vane in a normal position in the throat during normal operating conditions, and to allow the vane to temporarily yield to a deflected position when the vane is struck by heavy debris, and to return the vane to the normal position when the debris has passed.

US 6,409,109 B1

PEPPER GRINDING TOOL

Hua-Te Wu, Tainan, Taiwan, assignor to Yienn Lih Enterprise Co., Ltd., Tainan, Taiwan

Filed Dec. 22, 1999, Appl. No. 468,942
Int. Cl. A47J *42/04*
U.S. Cl. 241—169.1 **3 Claims**

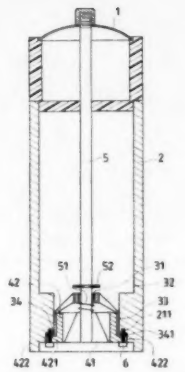
1. A pepper grinding tool, comprising:

(a) a main body, said main body having a holding chamber formed therein and an annular recess formed on an inner side thereof;

(b) a socket, said socket having an annular wall surrounding a central opening and a first rim connected to a lower end portion of said annular wall, said first rim having a plurality of through holes formed therein, said socket being received in said holding chamber of said main body with said first rim fitted into said annular recess of said main body;

(c) a grinding member disposed in said central opening of said socket and consisting of:

(1) an outer grinding part having a holding room formed therein and a second rim formed on a lower end portion of said outer grinding part, said second rim having a plurality of through holes formed therein, said outer grinding part



being received in said central opening of said socket with said second rim thereof arranged under said first rim of said socket with said plurality of through holes in said second rim being respectively aligned with said plurality of through holes of said first rim and a plurality of screws being respectively passed through said plurality of aligned through holes of said first and second rims into said main body to secure said outer grinding part and said socket to said main body, and

(2) an inner grinding part rotatably disposed in said holding room of said outer grinding part for permitting pepper to be ground between said inner grinding part and said outer grinding part; and,

(d) a transmission shaft passed through said socket and said outer grinding part, and having one end connected to said inner grinding part, said shaft having another end passed through a cover of said main body, said shaft having a stopping protrusion disposed above said socket for limiting downward passage of said shaft;

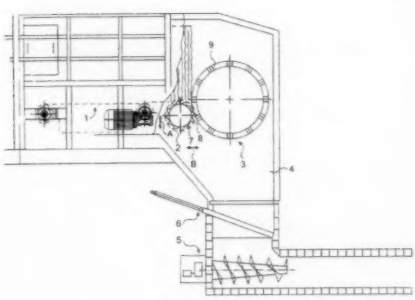
whereby pepper is ground into small particulates between said inner and said outer grinding parts, and dispensed from a bottom side of said grinding member.

US 6,409,110 B1

APPARATUS FOR PROCESSING COMPACTED BIOMASS

John E. Piper, Hillerød, Denmark, assignor to Babcock & Wilcox Volund APS, Esbjerg, Denmark

Filed Feb. 14, 2000, Appl. No. 503,322
Claims priority, application European Pat. Off., Feb. 15, 1999, 99102963
Int. Cl. B02C *4/16*
U.S. Cl. 241—236 **9 Claims**



1. Apparatus for processing compacted biomass, said apparatus comprising

a conveying system, including controllable drive means, for forwarding compacted biomass in a controlled manner in a mainly horizontal direction,

a first rotatable roller and a second rotatable roller positioned downstream of the conveying system, said first and second rollers having their axes of rotation extending generally horizontal and parallel to each other, the first roller being positioned horizontally closer to the conveying system than the second roller so as to first receive the compacted biomass,

said first and second rollers being rotated in opposite directions with different peripheral speeds and the rollers being provided with teeth-like elements projecting from outer surfaces thereof to engage the compacted biomass and passing the biomass through a gap formed between the two rollers, the peripheral speed of the second roller being higher than the peripheral speed of the first roller.

US 6,409,111 B1

APPARATUS FOR REDUCING THE OVERSIZED FRACTION OF CHIPS

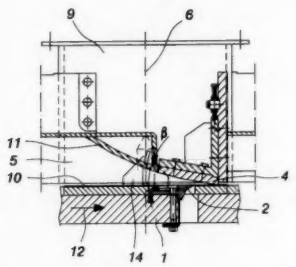
Pekka Kokko, Hollola, Finland, assignor to Andritz-Patentverwaltungs-GmbH, Graz, Austria

Filed May 26, 2000, Appl. No. 579,603

Claims priority, application Finland, May 28, 1999, 991219

Int. Cl. B02C *18/18*

U.S. Cl. 241—242 **19 Claims**



1. An apparatus for reducing the oversized fraction of chips, which apparatus comprises a rotatingly fitted disc-like rotor part (**1**) to which are attached a number of chipping blades (**2**), and a fixed stator part (**3**) surrounding the rotor part (**1**), to which stator part are attached a number of counter blades (**4**), the blades (**2**) and counter blades (**4**) being arranged in a chipping chamber (**5**), through which the chips to be reduced are arranged to travel outward with respect to the rotating shaft (**6**) of the rotor part (**1**), characterized in that the counter blades (**4**) are fitted in a position substantially deviating from the radial direction of the rotating shaft (**6**), when viewed on the vertical plane with respect to the rotating shaft (**6**) of the rotor part (**1**), and that the chipping chamber (**5**) is formed by the space between two counter blades (**4**), the bottom surface (**10**) of which space is formed by the top surface of the rotor part (**1**), and the roof surface (**11**) by the bottom surface of the stator part (**3**) and counter blade (**4**) opposite to the top surface of the rotor part (**1**), whereby, when viewed in the direction of rotation (**12**) of the rotor part (**1**), the said roof surface (**11**) is arranged to converge towards the said bottom surface (**10**).

US 6,409,112 B1

DUAL-BEARING REEL HAVING CONTROL KNOB FOR ADJUSTING BRAKING FORCE

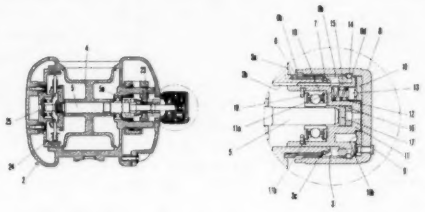
KwangHo Hyon, KyongKi-Do, Rep. of Korea, assignor to Toyo Engineering Co., Ltd., Kyongki-do, Rep. of Korea

Filed Aug. 30, 2000, Appl. No. 650,617

Claims priority, application Rep. of Korea, Sep. 2, 1999, 99-37982

Int. Cl. A01K *89/02*

U.S. Cl. 242—285 **1 Claim**



1. A dual-bearing reel having a control knob for adjusting a braking force to be transferred to a spool shaft, the reel comprising:

a control knob fixing arm protruding from a side cover of the reel;

a pin holder having a boss inserted into a groove of the control knob fixing arm, and a groove for receiving a ring;

a spring positioned in a hole of the pin holder to support a click pin;

a plate being interposed between the control knob and the control knob fixing arm, the plate having a plurality of locking grooves on an outer periphery thereof and a plurality of concave grooves adjacent a center hole thereof;

a nut having a groove inserted into the control knob fixing arm;

a locking pin extending into one of the plurality of locking grooves through the control knob, wherein when the control knob is rotated, the plate is caused to rotate with the control knob and one end of the click pin strikes the concave grooves to generate a click sound.

US 6,409,113 B1

DUAL-BEARING REEL BODY

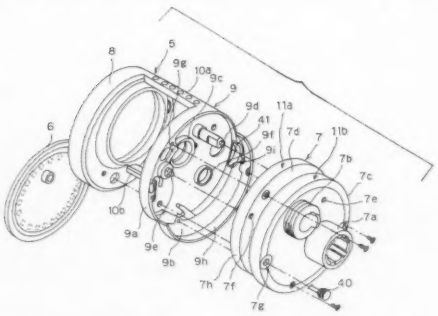
Hirokazu Hirayama, Sakai, and Tomoharu Sakurai, Wakayama, both of Japan, assignors to Shimano Inc., Osaka, Japan

Filed Nov. 13, 2000, Appl. No. 709,649

Claims priority, application Japan, Nov. 19, 1999, 11-330607

Int. Cl. A01K *89/015*

U.S. Cl. 242—310 **16 Claims**



1. A fishing-rod attachable dual-bearing reel body on a lateral surface of which a handle is disposed and interiorly in which a spool is disposed on a shaft, the dual-bearing reel body comprising:

a frame having a pair of side-plates between which the spool is disposed and connecting members for connecting the side-plates;

a pair of side-covers exteriorly covering either side-plate, said handle being mounted on a proximal one of the pair of side-covers; and

a fishing rod mount disposed between the pair of side-plates for attachment to a fishing rod; wherein

on the side in which the handle is mounted, said proximal side-cover together with a proximal one of the side-plates constitute a first cylindrical portion interiorly having a columnar first space, and a second cylindrical portion staggered such that the outer circumference of the second cylindrical portion intersects the outer circumference of the first cylindrical portion, therein protruding outward in the spool shaft direction with respect to the first cylindrical portion and interiorly having a columnar second space communicating interiorly with the said first space.

US 6,409,114 B1

YARN FEEDING DEVICE

Patrik Jonas Magnusson, Boras, and Alf Bengtsson, Fritsla, both of Sweden, assignors to IRO Patent AG, Baar, Switzerland

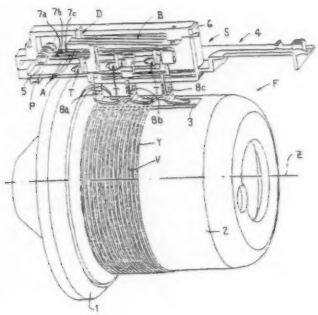
PCT No. PCT/EP98/08298, § 371 Date Oct. 2, 2000, § 102(e) Date Oct. 2, 2000, PCT Pub. No. WO99/30998, PCT Pub. Date Jun. 24, 1999

PCT Filed Dec. 17, 1998, Appl. No. 581,693

Claims priority, application Germany, Dec. 17, 1997, 197 56 243

Int. Cl. B65H *51/20*

U.S. Cl. 242—364.7 **17 Claims**



1. A yarn feeding device having a storage drum for storing a yarn store including adjacently laid down windings of a yarn, a sensor device provided within a sensor housing arranged outside of said storage drum, said sensor device comprising a plurality of movably supported feeler arms each of which extends by a feeler arm portion carrying a feeler foot into the movement path of the windings along said storage drum and each of which is displaced by said windings out of a home position, a spring assembly loading each feeler arm in a direction towards its home position, and a signal generating detecting device for detecting an initial position of each said feeler arm, said plurality of feeler arms being supported with their feeler arm portions on a common axis.

US 6,409,115 B1

SEAT BELT RETRACTOR

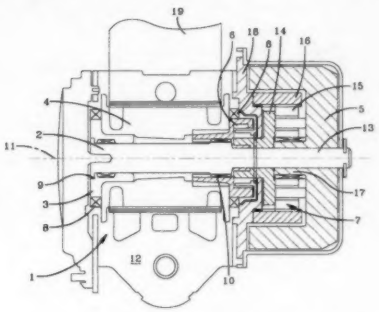
Martin Specht, Feldafing, and Thomas Kilian, Germ, both of Germany, assignors to Breed Automotive Technology, Inc., Lakeland, Fla.

Filed Oct. 16, 2000, Appl. No. 690,121

Claims priority, application Germany, Oct. 21, 1999, 199 50 855

Int. Cl. B65H *75/48*

U.S. Cl. 242—379.1 **16 Claims**



1. A seat belt retractor comprising a belt reel upon which a seat belt can be wound and unwound, and a force limiter comprising an energy-consuming material that is arranged between at least one first reel part that can be blocked by a blocking device against rotation and at least one second reel part that is rotatable upon energy consumption of the force limiter, wherein an inertial mass can be coupled to the second reel part for entrainment by means of a coupling, which is engaged upon blocking of the first reel part and rotation of the second reel part.

US 6,409,116 B1

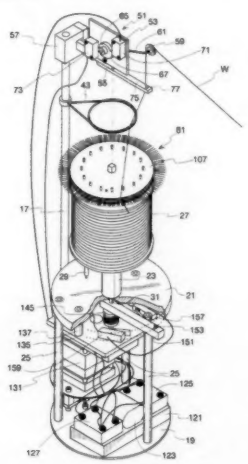
RAPIDLY ADJUSTABLE WIRE CONTROL MECHANISM

Maurice H. Brown, 502 W. Main, Albion, Nebr. 68620, assignor to Maurice H. Brown, Albion, Nebr.

Filed Oct. 30, 2000, Appl. No. 698,408

Int. Cl. B65H *59/10;54/553;23/06*

U.S. Cl. 242—419.1 **2 Claims**



1. A wire tensioning device for maintaining tension on a moving wire as the wire is uncoiled over the axial end of a fixed spool of wire including:

a disk adapted to be mounted on the axial end of a spool of wire,
said disk having a plurality of radially extending resilient filaments that protrude beyond the periphery of the axial end of the spool of wire,
said filaments engaging said wire as it is unwound from said spool over said axial end of said spool to thereby apply a resistance to the uncoiling of said wire,
a drive shaft powered by a reversible motor for rapidly responding to changes in said resistance applied to said uncoiling wire by bending or unbending of said filaments,
said disk operably connected to said drive shaft,
an arm engaged by said uncoiling wire,
said arm connected to a rotatably mounted axle for pivotal movement in a limited arc,
a rotor mounted on said axle,
a lobe formed on said rotor,
a pair of proximity switches for operating said reversible electric motor in opposite directions of rotation,
one of said pair of said proximity switches positioned on each of diametrically located opposite sides of said rotor,
said proximity switches positioned relative to said rotor to position said lobe in actuating proximity to only one of said pair of proximity switches during rotation of said axle in response to pivotal movement of said arm within said limited arc.

US 6,409,117 B2

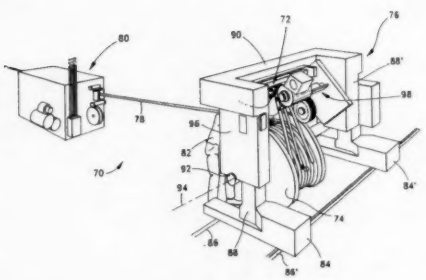
REEL MONITOR DEVICES AND METHODS OF USING THE SAME

Mark W. Petersen, Concord; Brian S. Witz, Greensboro; John J. McGirr, Jr.; Lance G. Gilmet, both of Clemmons, and James M. Gary, Cary, all of N.C., assignors to Corning Cable Systems LLC, Hickory, N.C.

Continuation of application No. 09/344,798, filed on Jun. 25, 1999, now Pat. No. 6,247,664. This application May 7, 2001, Appl. No. 850,016.

Int. Cl. B65H *63/08;54/38;23/18*

U.S. Cl. 242—485.6 **14 Claims**



9. A method for automatically controlling a machine that rotates a reel for winding or unwinding cable, comprising:
detecting the presence and position of an object between a pair of flanges of the reel relative to the rotational axis of the reel with an arm longitudinally extendible between the flanges and outputting a position signal indicating the detected presence and position;
comparing the position signal to a previously-received position signal stored in a memory of a controller using a processor associated with the controller in order to determine a position change value; and
sending an output signal to the machine to control the reel.

US 6,409,118 B1

CONTACT ROLLERS FOR A WINDING MACHINE

Armin Hutzenlaub, and Dietmar Kunkel, both of Wiehl, Germany, assignors to Kampf GmbH & Co. Maschinenfabrik, Wiehl, Germany

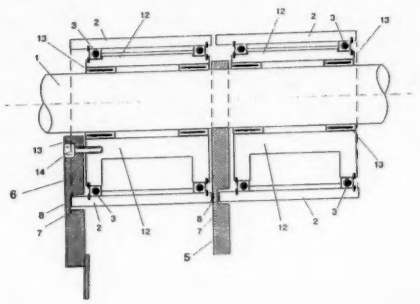
PCT No. PCT/EP99/06826, § 371 Date Apr. 18, 2001, § 102(e) Date Apr. 18, 2001, PCT Pub. No. WO00/23364, PCT Pub. Date Apr. 27, 2000

PCT Filed Sep. 15, 1999, Appl. No. 807,758

Claims priority, application Germany, Oct. 21, 1998, 198 48 532

Int. Cl. B65H *18/26*

U.S. Cl. 242—547 **6 Claims**



1. In combination with a winding roll, a contact-roller system comprising:
an elongated support shaft extending along a rotation axis;
respective inner bodies spaced axially along the shaft and having axially opposite ends, the ends of axially adjacent bodies axially confronting each other and being axially separated from each other by a predetermined great axial spacing;
respective coaxial and tubular rollers rotatable on the bodies and having annular opposite ends defining gaps lying between the ends of the respective bodies, the ends of adjacent rollers axially confronting each other and being axially separated from each other by a predetermined small axial dimension substantially smaller than the great axial spacing between the respective bodies, whereby at each of the gaps the end of at least one of the respective rollers projects axially past the end of the respective body; and
a plurality of elements each having
a radial outer part of an axial thickness greater than the small axial dimension and lying outside the rollers at a respective one of the gaps,
an inner part of an axial thickness also greater than the small axial dimension and lying inside the rollers between the respective bodies at the respective one gap, and
an arcuate web part between and unitary with the respective inner and outer parts, forming an arcuate axial groove in which one of the ends of the respective rollers engages axially, and of an axial dimension equal to slightly less than the small axial dimension.

US 6,409,119 B1

WINDING CORE FIXING DEVICE

Mitoshi Yabuno, Kyoto, Japan, assignor to Nishimura Seisakusho Co., Ltd., Kyoto, Japan

PCT No. PCT/JP00/03088, § 371 Date May 23, 2001, § 102(e) Date May 23, 2001, PCT Pub. No. WO00/69763, PCT Pub. Date Nov. 23, 2000

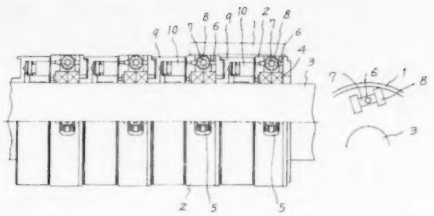
PCT Filed May 12, 2000, Appl. No. 856,595

Claims priority, application Japan, May 17, 1999, 11-003337

Int. Cl. B65H *75/26*

U.S. Cl. 242—571.6 **1 Claim**

1. The winding core fixing apparatus comprising:



a plurality of pins extending axially of a winding shaft and supported to be spaced angularly from each other around said winding shaft;

a plurality of axles extending in a direction of rotation of said winding shaft, supported by said pins for swingingly movement and having opposite ends which are disposed on the opposite sides of said pins; and

a plurality of rotatable bodies provided on the opposite ends of said axles,

one of said rotatable bodies of said opposite ends of each of said axles being pressed against the inner surface of a winding core to thereby fix said winding core in accordance with the rotation of said winding shaft.

US 6,409,120 B1

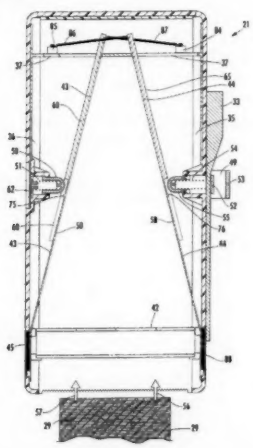
DISPENSER APPARATUS AND METHOD

Paul F. Tramontina, Alpharetta, and Stephen L. Phelps, Lilburn, both of Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Mar. 29, 2000, Appl. No. 537,275

Int. Cl. B65H *16/02*

U.S. Cl. 242—594.5 **20 Claims**



1. An assembly for automatically mounting and then dispensing an absorbent paper roll, comprising:

a housing having an interior space and an exterior cover, and at least one paper roll insertion pathway extending into the interior space of the housing,

a pair of opposed elongated support members, wherein the elongated support members are adapted to movably engage the sides of a paper roll, the elongated support members being mounted on the interior of the housing in spaced relation to each other,

a first pair of projections within the interior space of the housing, at least one projection being operably connected to an elongated support member, said projections being adapted to engage the sides of the paper roll upon displacement of the elongated support members by insertion of the paper roll into the interior space of the housing along the insertion pathway, the projections being adapted to form a fixed mounting axis from which the roll may be dispensed, and

a stub roll unit, wherein the stub roll unit is adapted to dispense a partially consumed roll, the stub roll unit comprising a suspension apparatus for operatively engaging and dispensing a stub roll,

wherein the assembly is adapted for automatically receiving and mounting a paper roll through the insertion pathway within the interior space of the housing upon the insertion of the paper roll into the housing.

US 6,409,121 B1

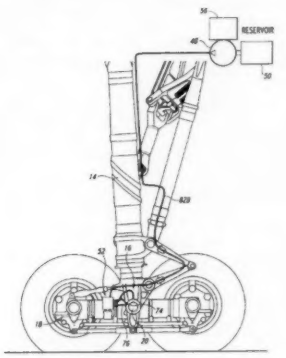
IN FLIGHT AUTOLUBRICATION SYSTEM FOR THE MECHANICAL MEMBERS OF AIRCRAFT LANDING GEAR

Gary M. Lindahl, Newcastle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 30, 2000, Appl. No. 652,589

Int. Cl. B64C *25/02*

U.S. Cl. 244—100 R **4 Claims**



1. An automatic lubrication system for an aircraft's landing gear comprising;

said endcap further comprising a pressure outlet and fill inlet disposed thereon; and

said piston assembly urges towards the endcap pressurizing the reservoir in response to the pressurized hydraulic fluid supplied to the pressurized chamber.

a lubricant reservoir;

a lubricant pump for providing motive force for moving lubricant;

a lubricant distribution; system fluidly coupling the lubricant reservoir to the pump;

said lubricant pump fluidly coupled to at least one lubrication point;

means for producing a lubrication signal in response to sensed aircraft parameters;

means for activating the lubricant pump in response to said lubrication signal;-

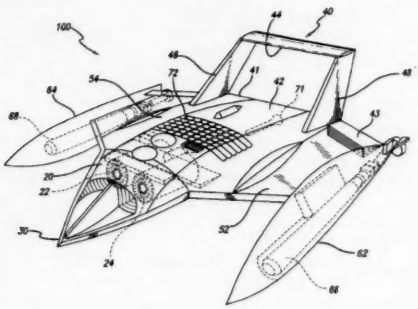
a housing having a stepped chamber defining a piston bore and piston-rod bore;

a piston assembly disposed in said housing free to reciprocate axially wihtin the chamber and dividing into a lubricant reservoir chamber portion and a pressurized chamber portion;

an air exit passage extending from the reservoir side piston face axially through the piston assembly to the piston-rod;

an endcap terminating one end of the housing defining the reservior chamber.

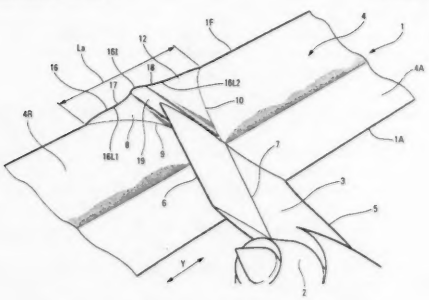
US 6,409,122 B1
ANTI-SUBMARINE WARFARE UAV AND METHOD OF USE THEREOF
Leland M. Nicolai, Castaic, Calif., assignor to Lockheed Martin Corporation, Palmdale, Calif.
Filed Jan. 17, 2001, Appl. No. 761,076
Int. Cl. B64C *35/00*
U.S. Cl. 244—106 **9 Claims**



1. An unmanned anti-submarine warfare aircraft, comprising:

a body portion having a catamaran configuration adapted for stably supporting said body portion when sitting in water, said body portion including a fuselage and laterally disposed sponsons connected to said fuselage via platforms, said sponsons being deployable from said fuselage while said aircraft is airborne over a predetermined target location, said sponsons being further deployable from said fuselage while said aircraft is sitting in the water, and submarine detecting equipment housed within said fuselage and adapted to be linked to sonobuoys disposed in adjacent water locations.

US 6,409,123 B2
AIRCRAFT WING STRUCTURE PROFILED SUSPENSION PYLON
Jean-Louis Cambon, La Salvetat Saint Gilles, France, assignor to Eads Airbus SA, Paris, France
Filed Mar. 6, 2001, Appl. No. 798,918
Claims priority, application France, Apr. 10, 2000, 00 04561
This patent is subject to a terminal disclaimer.
Int. Cl. B64C *1/38*
U.S. Cl. 244—130 **7 Claims**



1. An aircraft wing structure suspension pylon, said wing structure comprising a pressure face, the rear part of which is concave and set back with respect to the front part of said pressure face, said pylon:

being suspended from said wing structure, projecting with respect to said pressure face of the wing structure, having a leading edge and a trailing edge and being profiled to comprise, between said leading edge and said trailing edge, a section of maximum width; which is arranged at the front of said concave and set-back rear part of the pressure face of the wing structure; and

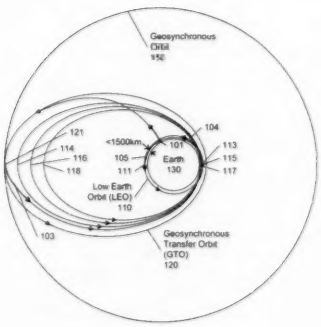
being equipped with a fairing for reducing the local loss of aerodynamic lift, which:

is placed in contact with the pressure face of said wing structure and extends heightwise over part of said pylon and is housed, at least over most of the height of said fairing, in the concavity of said rear of the pressure face of the wing structure;

extends toward the rear of the wing structure, and continues beyond the trailing edge thereof, in the form of a projecting rear part with an upper surface in aerodynamic continuation of the suction face of said wing structure, said fairing being arcuate in shape and widening laterally, and extending from said suspension pylon, where said fairing has a width at least approximately equal to said maximum width of said suspension pylon, as far as the trailing edge of the wing structure, where said fairing has a width at least equal to twice said maximum width of said suspension pylon; and

comprises an underside which comes close to said upper surface, in aerodynamic continuation of the suction face of the wing structure so as to give said projecting rear part of the wing structure so as to give said projecting rear part of said fairing the shape of a blade which tapers toward the rear and ends in an aerodynamic trailing edge, which projects from the trailing edge of the wing structure and extends along the latter over a length corresponding to said width of said fairing at said trailing edge of the wing structure, the trailing edge of said projecting rear part having an intermediate part and two lateral parts, said intermediate part being in the aerodynamic continuation of said maximum-width section of said pylon and projecting further, with respect to the trailing edge of the wing structure, than said lateral parts.

US 6,409,124 B2
HIGH-ENERGY TO LOW-ENERGY ORBIT TRANSFER VEHICLE
Richard D. Fleeter, 11573 Greenwich Point, Reston, Va. 20194
Division of application No. 09/350,813, filed on Jul. 9, 1999, now Pat. No. 6,286,787. This application Jun. 13, 2001, Appl. No. 880,605.
This patent is subject to a terminal disclaimer.
Int. Cl. B64G *1/22*
U.S. Cl. 244—158 R **16 Claims**



1. A method of deploying a payload satellite into a target orbit having an associated target-orbit energy-level, comprising:

placing the payload satellite on a launch vehicle,

launching the launch vehicle,

deploying the payload satellite from the launch vehicle with an associated kinetic energy, the kinetic energy associated with

the payload satellite being substantially greater than the target-orbit energy-level associated with the target orbit, and

maneuvering the payload satellite into the target orbit via a reduction in the kinetic energy associated with the payload satellite, to an energy level corresponding to the target-orbit energy-level.

US 6,409,125 B1

POSITIONING SYSTEM FOR A MEASURING INSTRUMENT ON A SATELLITE

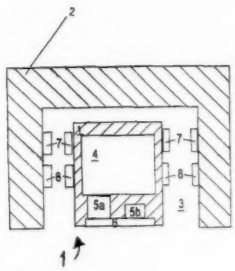
Hartmut Jörck, Wiemersdorf, Germany, assignor to Astrium GmbH, Friedrichshafen, Germany

Filed May 10, 2000, Appl. No. 568,006

Claims priority, application Germany, May 10, 1999, 199 21 390

Int. Cl. B64G *1/66*

U.S. Cl. 244—171 **10 Claims**



1. A positioning system for a high precision measuring instrument on a satellite, said positioning system comprising a support structure secured to the satellite, said precision measuring instrument being freely movable with at least one degree of freedom within a space provided in the satellite support structure, and a first positioning device operatively coupling said precision measuring instrument and said satellite support structure, said measuring instrument producing signals which cause the first positioning device to produce movement of said measuring instrument to inertially align said measuring instrument with a target and to produce movement of said satellite support structure to follow the movement of said measuring instrument.

US 6,409,126 B1

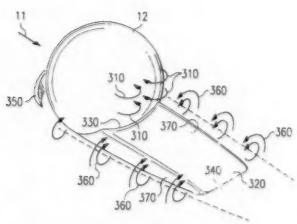
PASSIVE FLOW CONTROL OF BLUFF BODY WAKE TURBULENCE

Atlee Marion Cunningham, Jr., Forth Worth, Tex., assignor to Lockhead Martin Corporation, Bethesda, Md.

Filed Nov. 1, 2000, Appl. No. 703,877

Int. Cl. B64C *23/06*

U.S. Cl. 244—199 **18 Claims**



1. On a generally planar flow surface having a body disposed thereon, an apparatus for controlling turbulence generated by a medium passing about said body, wherein said medium passes from a front of said body to an outboard side of said body, the apparatus comprising;

a vortex fence disposed on said flow surface in front of said body, said vortex fence positioned enabling a predetermined gap width between said vortex fence and body;

an aft fairing disposed on said flow surface on said outboard side of said body with a leading edge portion positioned in close proximity to an aft face of said body; and

a forward fairing comprising:

a lower surface portion having a width substantially equal to a width of said body;

a trailing edge portion having a surface contour substantially equal to a surface contour of a forward side of said body said vortex fence integrated into said trailing edge portion of said forward fairing, wherein said forward fairing is positioned enabling said predetermined gap width; and

an upper surface portion having a tilt with a maximum height from said flow surface at said trailing edge portion and extending forwardly to a minimum height at a leading edge portion of said forward fairing.

US 6,409,127 B1

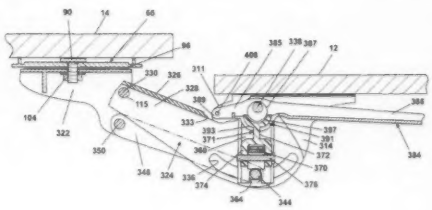
ADJUSTABLE KEYBOARD SUPPORT MECHANISM

Craig L. VanderHeide, Comstock Park, and John P. Conner, Grandville, both of Mich., assignors to Knape & Vogt Manufacturing Co., Grand Rapids, Mich.

Provisional application No. 60/105,886, filed on Oct. 27, 1998. This application Sep. 17, 1999, Appl. No. 398,414.

Int. Cl. A47B *57/00*

U.S. Cl. 248—118 **63 Claims**



1. An adjustable keyboard support assembly, comprising:

a keyboard tray support bracket;

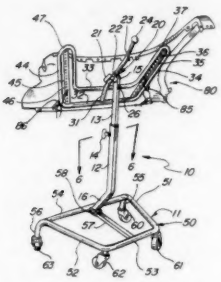
a work surface mounting bracket adapted to be coupled to a work surface;

a connector mechanism having one end coupled to the work surface mounting bracket and an opposite end coupled to the keyboard tray support bracket, the connector mechanism comprising a support arm mounted at one end to the work surface mounting bracket and a coupling mounting another end of the support arm to the keyboard tray support bracket for rotatable movement of the keyboard tray support bracket about a horizontal axis with respect to the support arm;

an angle control mechanism between the keyboard tray support bracket and the support arm for locking the keyboard tray support bracket at a desired angular inclination with respect to the support arm, the angle control mechanism including a spring exerting a clamping pressure on the support arm and the keyboard tray support bracket and a spring lifter for repositioning the spring so as to relieve the pressure applied to the support arm and the keyboard tray support bracket; and

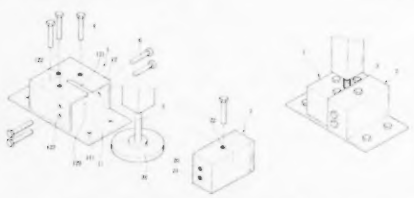
a lever control bar coupled to the keyboard tray support bracket and spring lifter for selective repositioning of the spring lifter for selective adjustment of the keyboard tray support bracket with respect to the support arm.

US 6,409,128 B1
PAINTING STAND FOR VEHICLE PARTS SUCH AS BUMPERS
Donald T. Deshler, 414 N. Cambridge St., Orange, Calif. 92866
Continuation-in-part of application No. 09/390,502, filed on Sep. 3, 1999, now Pat. No. 6,158,701. This application Sep. 21, 1999, Appl. No. 399,836.
This patent is subject to a terminal disclaimer.
Int. Cl. F16M *11/00*
U.S. Cl. 248—127 **13 Claims**



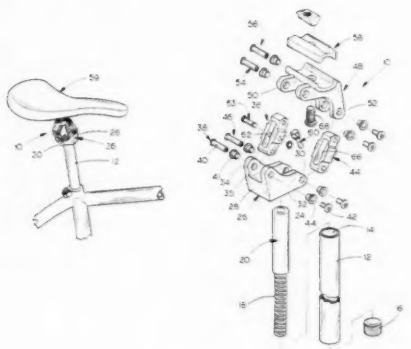
1. A painting stand for supporting one or more vehicle body parts or accessories for spray painting, said painting stand comprising:
- a base having a base frame and a plurality of casters for rollingly supporting said base;
- a vertical post supported by said base frame and extending upwardly therefrom;
- a post extension slidably supported by said vertical post and having an upper end;
- height adjustment means for securing said post extension to said vertical post at a selected height;
- a support rack having a cross member and a pair of wings each having a lower portion and an elongated attachment bar defining a plurality of apertures therein, said support rack having means for adjusting the position of said pair of wings;
- a pivot bracket supporting said cross member;
- a pivotal attachment pivotally securing said pivot bracket to said upper end of said post extension; and
- a gas spring coupled between said post extension and said pivot bracket.

US 6,409,129 B1
FIXING DEVICE FOR SETTING ANTI-SHOCK FOOT STAND
Jun-Ming Chen, Tai-Nan, and Chin-Jen Chen, Chang-Hua Hsien, both of Taiwan, assignors to Silicon Integrated Systems Corporation, Hsinchu, Taiwan
Filed Sep. 2, 2000, Appl. No. 654,228
Int. Cl. A47B *91/00*
U.S. Cl. 248—188.8 **3 Claims**



1. A fixing device for setting anti-shock foot stand, comprising:
- a casing having a shed housed on a deck, wherein an inner space is available in the shed; at least a slot is formed in a ceiling of the shed; one end of the slot is extended to reach an edge of the ceiling; a plurality of tapped holes and through holes are disposed in the ceiling and two lateral walls of the shed respectively; and a plurality of through holes is perforated in the deck; and
- a positioning seat having at least a tapped hole and a plurality of tapped holes disposed in a ceiling and in two lateral walls thereof respectively at positions corresponding to those lateral through holes in the shed;
- wherein the positioning seat is coupled to the casing by means of a plurality of bolts locked in the tapped holes of the two lateral walls of the positioning seat and penetrating through the corresponding through holes of the two lateral walls of the shed.

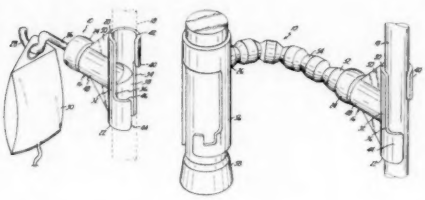
US 6,409,130 B1
PIVOTING SUSPENSION SEAT POST FOR A BICYCLE SEAT
Kevin L. Maret, 2111 Atwood La., Lincoln, Nebr. 68521
Provisional application No. 60/151,978, filed on Sep. 1, 1999. This application Aug. 30, 2000, Appl. No. 651,762.
Int. Cl. A47B *96/06*
U.S. Cl. 248—219.2 **16 Claims**



1. A pivoting suspension seat post adapted to be inserted into a bicycle frame tube for supporting a bicycle seat thereon, comprising:
- a tubular post having upper and lower ends;
- a lower body member secured to the upper end of said tubular post and having a forward end, a rearward end, first and second sides, and upper and lower ends;
- front and rear parallel arms having upper and lower ends;
- said lower end of said front parallel arm being pivotally secured to said lower body member at the upper forward end thereof and extending upwardly and rearwardly therefrom;
- said lower end of said rear parallel arm being pivotally secured to said lower body member at the lower rearward end thereof and extending upwardly and rearwardly therefrom;
- an angular upper body member having an upper forward end and a lower rearward end;
- said upper forward end of said upper body member being pivotally secured to said upper end of said front parallel arm;
- said lower rearward end of said upper body member being pivotally secured to said upper end of said rear parallel arm;
- seat mounting means on said upper body member;
- a resilient means in said tubular post having upper and lower ends;
- an elongated pin means having upper and lower ends;
- said upper end of said pin means being secured to said front parallel arm between the upper and lower ends thereof;
- the lower end of said pin means being in operative engagement with the upper end of said resilient means in said post whereby downward and rearward movement of said upper

body member and the seat mounted thereon is yieldably resisted by said resilient means.

US 6,409,131 B1
EASILY RE-POSITIONABLE, QUICK ATTACH AND REMOVE, MULTIPLE PURPOSE SUPPORT SYSTEM
Ronald L. Bentley, 1428 Bartlett Ave., Altoona, Wis. 54720, and Bruce R. Rosenau, 4400 LaSalle St., #12, Eau Claire, Wis. 54703
Filed Feb. 14, 1997, Appl. No. 801,043
Int. Cl. A47B *6/06*
U.S. Cl. 248—219.4 **14 Claims**



1. A support system twistably attachable to an elongated prop comprising:

a bracket having an elongated saddle adapted to matingly fit the outer surface of the elongated prop, said elongated saddle having;

an outer surface,

an inner surface shaped to be matingly disposable against the outer surface of the elongated prop,

a first side,

a second side,

a first end,

a first resilient arm situated at said first end and extending from said first side claspably peripherally partially around said prop,

a second end,

a second resilient arm situated at said second end and extending from said second side opposite said first resilient arm, claspably peripherally partially around said prop,

an adaptor extending from said outer surface of said elongated saddle, said adaptor being shaped to matingly attach a detachable holder, and

a pair of generally planar, generally longitudinal graspable surfaces extending radially between said bracket and said saddle outer surface.

US 6,409,132 B2
ATTACHMENT BRACKET FOR A RAIL
Jon Charles Heisler, New Carlisle; Andrew Eric Wildman, Springfield; Samuel Anthony Ferralli, Dayton, and Douglas Joseph Noll, Troy, all of Ohio, assignors to Display Edge Technology, Ltd., Troy, Ohio
Filed Apr. 30, 1999, Appl. No. 302,650
Int. Cl. E04G *5/06*
U.S. Cl. 248—220.22 **49 Claims**

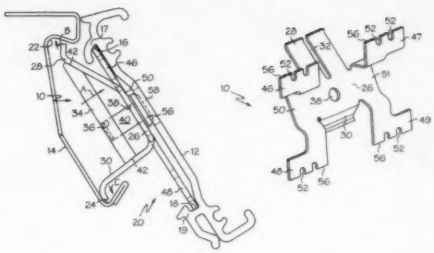
1. A bracket for coupling a rail having an upper slot and a lower slot to a shelf edge having an upper groove and a lower groove, the bracket comprising:

a central body portion;

an upper flange coupled to and extending generally upwardly from said body portion;

a lower flange coupled to and extending generally downwardly from said body portion;

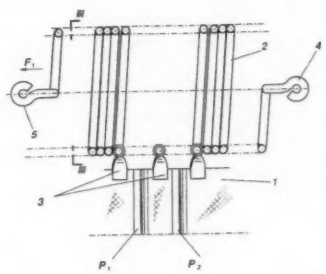
a plate received between said upper and said lower flanges such that as said plate is moved toward said body said plate urges said upper flange and said lower flange into said upper and lower groove, respectively, to couple said bracket to said shelf edge;



a first upper tang coupled to and extending generally upwardly from said body portion; and

a first lower tang coupled to and extending generally downwardly from said body portion, said upper tang and lower tang being shaped to be received in said upper and lower slot, respectively, at least one of said first tangs having at least one rail receiving portion located at a distal end thereof to facilitate the attachment of said bracket to said rail.

US 6,409,133 B1
CURTAIN SUPPORTING DEVICE
Jean-Francois Billan, 26, rue lebour, Paris, France
Filed Nov. 12, 1998, Appl. No. 147,252
Claims priority, application France, May 13, 1996, 96 05894
Int. Cl. A47H *1/10*
U.S. Cl. 248—261 **11 Claims**



1. A device for supporting a curtain comprising:

a U-shaped hollow rail comprising a length, a narrowed opening, and an upper straight surface;

a helically wound spring disposed inside the hollow rail and comprising a plurality of turns, a fixed end, and a moveable end;

a plurality of spring engaging projections disposed within the hollow rail for supporting the spring; and

a plurality of curtain holding members disposed on the plurality of turns wherein the plurality of holding members can move within the narrowed opening,

wherein the hollow rail supports the spring and the spring is adapted to support the curtain along the length of the hollow rail, the curtain being adapted to be supported only by the spring via the plurality of curtain holding members.

US 6,409,134 B1

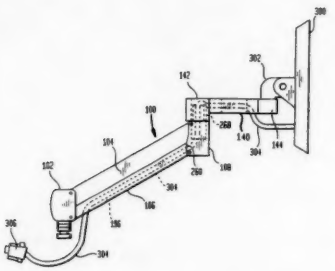
ARM APPARATUS FOR MOUNTING ELECTRONIC DEVICES WITH CABLE MANAGEMENT SYSTEM

Odd N. Oddsen, Jr., Easton, Pa., assignor to Innovative Office Products, Inc., Easton, Pa.

Provisional application No. 60/138,120, filed on Jun. 7, 1999. This application Sep. 24, 1999, Appl. No. 406,006.

Int. Cl. E04G *3/00*

U.S. Cl. 248—274.1 **85 Claims**



1. An extension arm for adjustably mounting a device to a support mount and hiding cables to and from the device within said extension arm, said extension arm comprising:

a forearm extension having a body, means for attachment to the device disposed at a first end of said body, and a second end coupling disposed at a second end, said second end coupling having a cable slot formed in a wall thereof so that said second end coupling and said body are in communication with each other through said cable slot;

a first endcap including a support shaft for attachment to the support mount;

a second endcap including a partially enclosed housing and a hollow shaft, said hollow shaft pivotably attached to said second end coupling;

an upper channel having a first roller disposed at a first end and configured to be pivotably attached to said first endcap, and a second roller disposed at a second end and configured to be pivotably attached to said second endcap;

a lower channel having a third roller disposed at a first end and configured to be pivotably attached to said first endcap, a fourth roller disposed at a second end and configured to be pivotably attached to said second endcap, and a cable channel formed therein that runs longitudinally along said lower channel from a point close to the first end of said lower channel to the second end of said channel so as to cut through said fourth roller and form an opening in the second end of said lower channel; and

a gas spring rotatably attached at a first end to said upper channel and adjustably attached at a second end to said first endcap, wherein said gas spring is configured to retain said upper channel, said lower channel, said first endcap and said second endcap in a parallelogram shape when the device is positioned.

US 6,409,135 B1

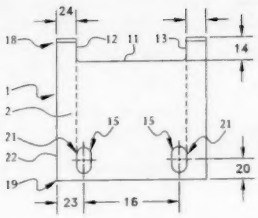
BASE SPACER

Gerald Bernard Roberts, Monroe, Mich., assignor to Hubbell Incorporated, Orange, Conn.

Filed Dec. 8, 1999, Appl. No. 456,314

Int. Cl. A47F *5/00*

U.S. Cl. 248—300 **8 Claims**



1. A base spacer plate for securing a horizontally extending first member to a vertically extending second member, comprising an extended horizontal surface and at least one deformable finger extending vertically from said horizontal surface, said horizontal surface including: (a) a pair of oval openings dimensioned to receive securing U-bolts, and (b) a channel along one edge of said base spacer plate having a length sufficient to locate U-bolts in a first horizontal direction, wherein said deformable finger extends from said horizontal surface at less than a right angle;

wherein said finger extends from said horizontal surface at an angle sufficient to contact said horizontally extending first member when positioned between said finger and U-bolts inserted into said oval openings and tightened against said vertically extending second member.

US 6,409,136 B1

HOLDER FOR A BEVERAGE CONTAINER

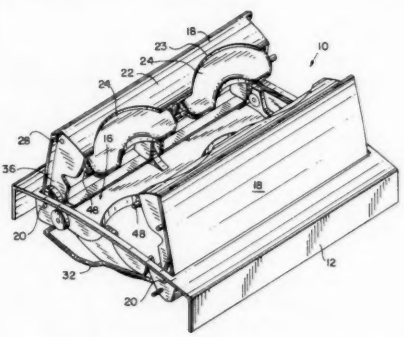
Martin Weiss, Bonn, Germany, and I. Mehmet Ozozturk, Solihull, United Kingdom, assignors to Fischerwerke Artur Fischer GmbH & Co. KG, Waldachtal, Germany, and Land Rover Group Limited, Warwickshire, United Kingdom

Filed Jul. 26, 2000, Appl. No. 625,716

Claims priority, application Germany, Jul. 27, 1999, 199 35 144

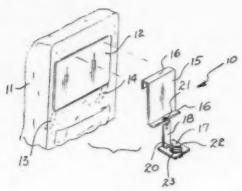
Int. Cl. B60R *7/04*

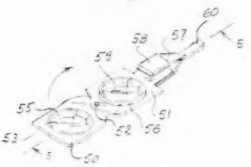
U.S. Cl. 248—311.2 **10 Claims**



1. A holder for a beverage container, comprising two holding elements that are turnable around two turning axes spaced from one another from a substantially lying position to a substantially standing position and vice versa so that said holding elements in said substantially standing position have a distance therebetween that allows insertion of a beverage container between said holding elements; a coupling transmission that provides an opposite turning movement of said holding elements; an opening spring element that turns said holding elements to a neutral substantially standing position, said holding elements being pressable from one another against a force of said opening spring element over said neutral position; and a releasable locking device that holds said holding elements against the force of said opening spring element in the substantially lying position.

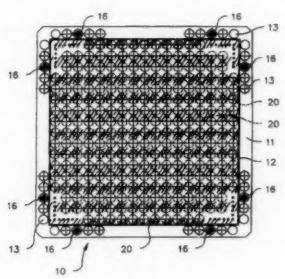
US 6,409,137 B1
ARTICULATED CUP TRAY
Yen Tran, 1100 N. Priest Dr. #1093, Chandler, Ariz. 85226
Provisional application No. 60/163,440, filed on Nov. 4, 1999. This application Sep. 28, 2000, Appl. No. 670,830.
Int. Cl. A47K *1/08*
U.S. Cl. 248—311.2 **4 Claims**





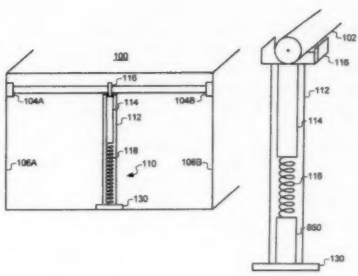
1. A food or beverage holder for use with a seatback tray comprising:
a stabilizing portion;
a support portion;
universal joint means operably coupling said support portion to said stabilizing portion;
at least one shallow recess in said support portion adapted to receive and retain a food or beverage container;
a mounting means carried on said stabilizing portion for supporting said stabilizing portion and said support portion from a supporting structure;
said stabilizing portion having two ends and includes a hook at one end and a ledge at another end;
said universal joint means including a hinge interconnecting said ledge with said support portion; and
said support portion includes a platform with said recess.

US 6,409,138 B1
SUPPORTING PLATE FOR FLEXIBLE BASE SUPPORTS FOR ELECTRONIC CIRCUITS
Gisulfo Baccini, Via Duca d'Aosta, 1 - 31030 Mignagola di Carbonera (TV), Italy
Filed Mar. 30, 2000, Appl. No. 538,695
Claims priority, application Italy, Apr. 2, 1999, UD99A0074
Int. Cl. A47B *91/00*
U.S. Cl. 248—346.01 **5 Claims**



1. A supporting plate for flexible base supports (**12**) for electronic circuits, the plate being characterized in that it is made of rigid material and comprises:
(a) a plane surface (**11**) on which said flexible base supports (**12**) rest;
(b) a first plurality of holes (**13**) provided in a peripheral zone of the plane surface (**11**) between edges of the flexible base support (**12**) and edges of the plate to define within the peripheral zone a maximum area wherein the flexible base supports (**12**) can be disposed; and
(c) at least one spacer element (**16**) protruding orthogonally from said plane surface (**11**) to allow another supporting plate (**10**) to be positioned on top of the at least one spacer (**16**), stacking up without interfering with the base support (**12**) resting on said plane surface (**11**) wherein each spacer element (**16**) is shaped to be elastically insertable, in a removable manner in any of the first plurality of holes (**13**) and includes an upper pin (**17**) and a corresponding lower cavity (**18**).

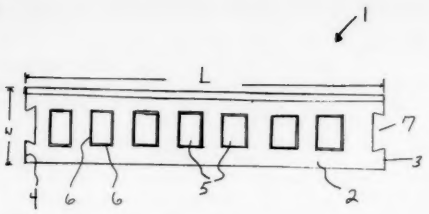
US 6,409,139 B1
ADJUSTABLE HEIGHT CLOSET ROD SUPPORT
Paul J. Du Pree, 2308 31st Ave. South, Seattle, Wash. 98144
Filed May 23, 2000, Appl. No. 576,506
Int. Cl. A47F *5/00*
U.S. Cl. 248—354.1 **13 Claims**



1. A rod support comprising,
a tubular housing;
a spring positioned inside the housing;
tubular insert positioned inside the housing and in contact with the spring, wherein the spring is arranged to urge the insert away from the housing in a telescoping manner;
a U-shaped cradle mounted to the insert to receive a horizontal rod; and
such that when the cradle receives the rod the spring compresses commensurate with the weight of the rod.

US 6,409,140 B1
TOOL FOR HANGING A FRAME
Martin L. Kratish, 5200 SW. 115th Ave., Cooper City, Fla. 33330, and Lawrence Kratish, 8741 Lake Dasha Terr, Plantation, Fla. 33324
Continuation-in-part of application No. 09/192,748, filed on Nov. 16, 1998, which is a continuation-in-part of application No. 08/970,598, filed on Nov. 14, 1997, now Pat. No. 5,927,675, which is a continuation-in-part of application No. 08/795,251, filed on Feb. 10, 1997, now abandoned. This application Feb. 15, 2000, Appl. No. 504,593.
This patent is subject to a terminal disclaimer.
Int. Cl. A47F *1/14;7/14;* **A47G** *1/16;1/06;* **B60K** *1/02*
U.S. Cl. 248—466 **21 Claims**

1. A frame hanging tool, comprising:
an elongated body member having a plurality of openings formed therein, each of said plurality of openings having an opening edge and a recessed border formed at least partly around said opening edge; and



at least one insert for receiving and guiding a fastener to be secured to a structure, said at least one insert having an overhanging edge and being inserted in one of said plurality of openings;

said recessed border self-securing to said overhanging edge for removably fastening said at least one insert to said body member.

US 6,409,141 B1

PARTICLE ANALYZER AND COMPOSITE LENS FORMED BY INTEGRALLY JOINING PLURAL LENS ELEMENTS OF DIFFERENT FOCAL POINTS

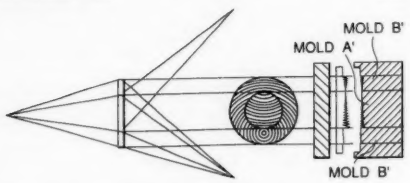
Masao Yamazaki; Yutaka Nagai; Katsuhiro Tsuchiya, and Yoshiyuki Takahara, all of Tokyo, Japan, assignors to Nihon Kohden Corporation, Tokyo, Japan

Division of application No. 09/038,281, filed on Mar. 11, 1998, now Pat. No. 6,084,670. This application Jul. 31, 2000, Appl. No. 629,425.

Claims priority, application Japan, Mar. 11, 1997, 9-072780; May 7, 1997, 9-131653

Int. Cl. B29D *11/00*

U.S. Cl. 249—117 **8 Claims**



1. A mold for shaping a composite lens comprising:

plural lens surfaces of different focal axes are annularly arranged in a molding face,

wherein said mold comprises two separate sections taken from non-concentric portions of an existing lens mold, said sections disposed in a concentric manner to form said mold.

US 6,409,142 B1

PIPE BREAKAGE CONTROL VALVE DEVICE

Masao Kariya, Tsuchiura, and Genroku Sugiyama, Ibaraki-ken, both of Japan, assignors to Hitachi Construction Machinery Co. Ltd., Tokyo, Japan

PCT No. PCT/JP00/07210, § 371 Date Jun. 4, 2001, § 102(e) Date Jun. 4, 2001, PCT Pub. No. WO01/29430, PCT Pub. Date Apr. 26, 2001

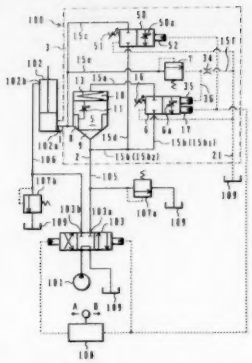
PCT Filed Oct. 18, 2000, Appl. No. 857,446

Claims priority, application Japan, Oct. 20, 1999, 11-298388

Int. Cl. F16K *31/12*

U.S. Cl. 251—44 **6 Claims**

1. A hose rupture control valve unit (**100**; **100**A; **100**B) provided between a supply/drain port (**102***a*) of a hydraulic cylinder (**102**) and a hydraulic hose (**105**) for controlling a flow rate of a hydraulic fluid coming out from said supply/drain port to said hydraulic hose in accordance with an external signal, wherein said valve unit comprises:



a poppet valve body (**5**) serving as a main valve slidably disposed in a housing (**3**) provided with a cylinder connecting chamber (**8**) connected to said supply/drain port (**102***a*), a hose connecting chamber (**9**) connected to said hydraulic hose (**105**), and a back pressure chamber (**10**), said poppet valve body being able to selectively cut off and establish communication between said cylinder connecting chamber and said hose connecting chamber, and changing an opening area depending on the shift amount thereof;

a feedback variable throttle passage (**11**) provided in said poppet valve body, having an initial opening area when said poppet valve body is in a cutoff position, and increasing an opening area thereof depending on the shift amount of said poppet valve body;

a first variable throttle portion (**6***a*) disposed in a pilot passage (**15***a*, **15***b*; **15***a*, **15***h*) connecting said back pressure chamber and said hose connecting chamber, and operated in accordance with the external signal to cut off and control a rate of pilot flow flowing from said cylinder connecting chamber to said hose connecting chamber through said feedback variable throttle passage, said back pressure chamber and said pilot passage; and

a second variable throttle portion (**50***a*) disposed in a sub-passage (**15***c*, **15***d*; **15***c*, **15***h*) connecting said cylinder connecting chamber and said hose connecting chamber, and operated in accordance with the external signal to cut off and control a rate of sub-flow passing through said sub-passage.

US 6,409,143 B1

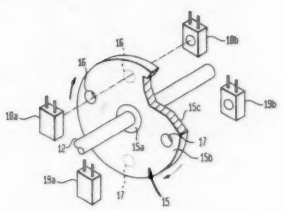
DAMPER ASSEMBLY WITH AN ELECTRO-OPTICAL CONTROLLER FOR POSITIONING THE DAMPER VANES

George N. Beck, Lake Forest, Calif., and Stanislaus Plepis, Elizabeth, N.J., assignors to EWC Controls Incorporated, Englishtown, N.J.

Filed Feb. 2, 2000, Appl. No. 496,539

Int. Cl. F16K *31/04*

U.S. Cl. 251—129.04 **6 Claims**



1. The combination with a damper assembly having, adjustably mounted damper vanes, a motor for positioning and repositioning

the damper vanes between an open position and a closed position and vice versa for controlling the volume of air flowing in an associated air flow system of an electro-optical controller comprising:

a. opaque means at all times fixedly connected and movable with the damper vanes to reflect the position of the damper vanes;

b. first means on the opaque means corresponding to the open position of the damper vanes and second means on the opaque means corresponding to the closed position of the damper vanes;

c. a first pair of coacting electronic elements including, a first light transmitting member and a first light sensing and signaling member fixedly mounted and in alignment with each other, for operative action with the first means corresponding to the open position of the damper vanes;

d. a second pair of coacting electronic elements including, a second light transmitting member and a second light sensing and signaling member fixedly mounted and in alignment with each other for operative action with the second means corresponding to the closed position of the damper vanes;

e. an electronic circuit including, an input signaling assembly for directing the electronic circuit to move the damper vanes between the open and closed position and vice versa, and an electronic switch assembly for starting and stopping the motor in accordance with the signals of the electronic circuit; and

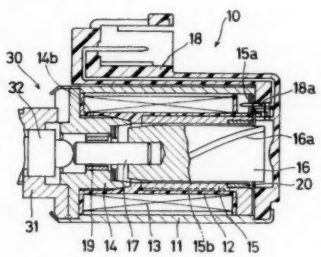
f. said first sensing and signaling member connected to the electronic circuit to signal when the damper vanes are in the open position and said second sensing and signaling member connected to the electronic circuit to signal when the damper vanes are in the closed position to enable the electronic circuit to direct the electronic switch assembly to start and stop the motor in accordance with the signals received from the input signal assembly by the electronic circuit, for positioning and repositioning the damper vanes.

US 6,409,144 B1

SOLENOID VALVE WITH INTEGRATED YOKE AND BOBBIN

Madoka Inami, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 15, 2000, Appl. No. 712,154
Claims priority, application Japan, Nov. 15, 1999, 11-324707
Int. Cl. F16K *31/02*
U.S. Cl. 251—129.15 **9 Claims**



5. A solenoid valve comprising:

an electric coil wound around a bobbin,

a case made of magnetic material and involving the electric coil,

a yoke made of magnetic material for forming a magnetic circuit in cooperation with the case and facing both longitudinal ends of the bobbin;

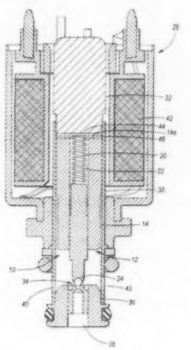
a plunger made of magnetic material disposed in an inner peripheral portion of the yoke, the plunger being longitudinally moved by electromagnetic force when current is supplied to the electric coil, the bobbin and the yoke being integrated with each other by insert forming, at least one of an outer peripheral portion of the yoke and a facing inner peripheral portion of the bobbin being provided with at least one of a grooved treatment extending in the longitudinal direction and knurling treatment.

US 6,409,145 B1

PLUNGER ASSEMBLY HAVING A PRESET SPRING FORCE PRE-LOAD

Keith B. Fong, El Paso, Tex.; Veronica Morales, Cd. Juarez, N. Mex.; Jeffrey Alan Heinrichs, Dayton, Ohio; Javier Gomez, Cd. Juarez Chih., and Omar Rocha, Juarez, both of N. Mex., assignors to Delphi Technologies, Inc., Troy, Mich.

Filed Feb. 28, 2000, Appl. No. 514,098
Int. Cl. F16K *31/02*
U.S. Cl. 251—129.18 **1 Claim**



1. A valve assembly comprising:

a tube having a forward end and an opposite rearward end;

a valve seat connected to said forward end;

a main body connected to said rearward end, said main body having an end, an abutment being located in said tube at said end of said main body;

a plunger assembly located within said tube, said plunger assembly comprising:

a plunger body having a central bore;

a rod partially received in said central bore, said rod having a first end and an opposite second end, wherein said first end is located in said central bore, and wherein a spring pocket is defined between said first end and said abutment, said plunger body and said rod collectively forming a plunger; and

a spring located in said spring pocket;

seal means for sealing said valve seat in response to said spring compression force, said seal means being located at said second end of said rod; and

actuation means for selectively forcing said plunger toward said main body, whereupon movement of said rod toward said main body results in said seal means becoming unsealed in relation to said valve seat;

wherein a press-fit between said rod and said central bore provides a compression of said spring between said first end and said abutment such that a resulting spring compression force equals a preset spring force pre-load; and

wherein said connection of said rearward end of said tube to said main body is selectively positioned relative to each other so as to provide a predetermined plunger travel cavity between said plunger body and said abutment.

US 6,409,146 B1

CHECK VALVE ARRANGEMENT FOR A DIAGNOSTIC TEST POINT

Frederick Hubert Van Essen, Brighton, Australia, assignor to Schroeder Industries, McKees Rocks, Pa.

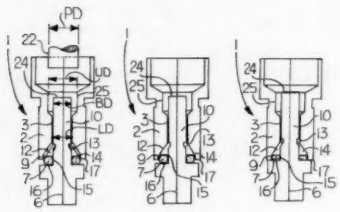
PCT No. PCT/AU99/00518, § 371 Date May 11, 2000, § 102(e) Date May 11, 2000, PCT Pub. No. WO99/67556, PCT Pub. Date Dec. 29, 1999

PCT Filed Jun. 25, 1999, Appl. No. 486,170

Claims priority, application Australia, Jun. 25, 1998, PP 4328

Int. Cl. F16K *51/00;31/44;31/00*

U.S. Cl. 251—149.1 **4 Claims**



1. A check valve for a test point for taking pressure measurements or fluid samples in a pressurised fluid system, said check valve including:

a housing with a bore passing therethrough,

a movable body located in said bore for providing opening and closing of said check valve, and

a seal located on said movable valve body for providing a sealing between said valve body and said bore,

wherein said check valve includes a collar means engaged on said movable valve body and movable thereon to support said seal.

US 6,409,147 B1

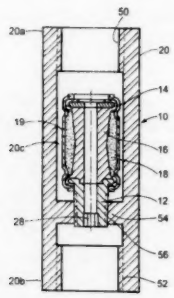
THERMALLY OPERATED VALVE FOR AUTOMATICALLY MODULATING THE FLOW OF FLUIDS

Thomas M. Kenny, 693 Nantmeal Rd., Glenmoore, Pa. 19343; Peter Hoynash, Perkiomenville, Pa.; Vincent F. Pettinato, Warminster, Pa., and Bruce S. Mitchell, Hatfield, Pa., assignors to Thomas M. Kenny, Glenmoore, Pa.

Filed Jun. 13, 2000, Appl. No. 592,821

Int. Cl. F16K *31/12;* **G05D** *23/12*

U.S. Cl. 251—268 **6 Claims**



1. A valve for automatically modulating a flow of fluid, the valve comprising:

a flexible flow adjustment member having a variable diameter passage therethrough and an outer surface, wherein the flexible flow adjustment member is made from VITON;

a shell surrounding at least a portion of the outer surface and creating a void between the shell and the outer surface, the shell being in contact with the flow of fluid; and

a thermally reactive material that expands when heated and contracts when cooled, the thermally reactive material being within the void and in contact with the outer surface of the flexible flow adjustment member for exerting pressure thereon in response to a heating of the thermally reactive material to cause a diameter of the variable diameter passage to decrease and to relieve pressure thereon in response to a cooling of the thermally reactive material to permit the diameter of the variable diameter passage to increase, a substantial portion of the thermally reactive material being configured to change phase to vapor in response to an increase in temperature within the internal cavity.

US 6,409,148 B1

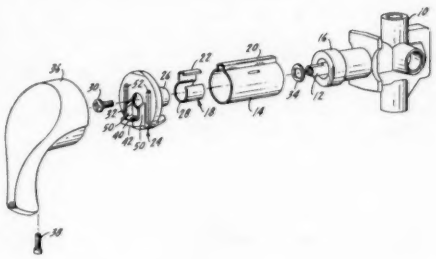
COMPOSITE HANDLE ADAPTER

James F. Dempsey, North Olmsted; John C. Holzheimer, Burton, and Matt R. Kesti, Cleveland, all of Ohio, assignors to Moen Incorporated, North Olmsted, Ohio

Filed Aug. 22, 2000, Appl. No. 642,605

Int. Cl. F16K *31/60*

U.S. Cl. 251—288 **9 Claims**



1. In combination, a shower valve having a metallic movable stem to control operation of the valve, a non-metallic, high strength, composite handle adapter secured to the stem for movement therewith, a metallic handle secured to the non-metallic handle adapter, said non-metallic handle adapter including a generally cylindrical body and an axially extending boss, with the body facing and being mounted to the metallic handle and the boss extending coaxially about the valve stem, movement of the handle concurrently moving the non-metallic handle adapter and metallic valve stem, the non-metallic handle adapter preventing galvanic corrosion between the metallic handle and the metallic valve stem.

US 6,409,149 B1

DUAL PENDULUM VALVE ASSEMBLY WITH VALVE SEAT COVER

Joseph Ashurst Maher, Jr., Wenham, Mass., assignor to MKS Instruments, Inc., Andover, Mass.

Continuation-in-part of application No. 09/606,382, filed on Jun. 28, 2000, now Pat. No. 6,328,051. This application Jul. 10, 2000, Appl. No. 612,812.

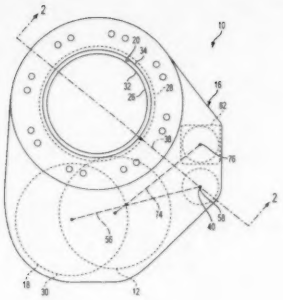
Int. Cl. F16K *3/06*

U.S. Cl. 251—328 **19 Claims**

1. A valve assembly comprising:

a) a housing including an interior space and a pair of openings through which fluid can enter and exit the interior space;

b) a first valve body movable within the interior space between an opened position allowing fluid to pass through a first of the openings and a closed position wherein the first valve body seals the first opening;



c) a second valve body movable within the interior space between an opened position allowing fluid to pass through a second of the openings and a closed position wherein the second valve body seals the second opening; and

d) an annular cover movable within the interior space between a first position wherein the cover protects a valve seat of the second opening and a second position wherein the cover is spaced from the valve seat such that the second valve body can engage the valve seat and seal the second opening, wherein the annular cover is movable in a parallel direction with respect to an axis of the second opening.

(III) a valve stem assembly disposed within the valve chamber, the valve stem assembly comprising a valve stem body, a valve stem attached to the valve stem body and a valve stem seal, the valve stem being movable between a retracted valve stem position and an extended valve stem position and being biased toward the extended valve stem position, the valve stem assembly being disposed within the valve chamber such that, (A) when the valve stem is in the extended valve stem position, the valve stem protrudes through the valve stem opening in the valve body cover into the valve body cover orifice and the valve stem seal is in sealing contact with the valve seat so as to seal closed the valve stem opening, and (B) when the valve stem is in the retracted valve stem position, the valve stem seal is spaced apart from the valve seat sufficient so that the valve stem opening is not sealed closed; and

whereby, when the valve body cover is detached from the valve body using an allen wrench tool, the valve stem is moved to the retracted valve stem position, so that any pressure within the valve body is discharged through the valve stem opening;

(b) depressurizing the pressurized tank by inserting an allen wrench tool into the valve body cover orifice;

(c) removing the valve body cover by rotating the valve body cover with the allen wrench tool used in step (b); and

(d) installing a new, undamaged valve body cover onto the valve body by rotating the new valve body cover using the allen wrench tool used in step (b).

US 6,409,150 B2

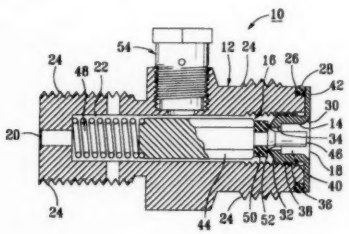
PIN VALVE WITH REMOVABLE VALVE BODY COVER

Dennis J. Sullivan, Sr., 9077 Reales St., Alta Loma, Calif. 91737, and Dennis J. Sullivan, Jr., 145 S. Rennell, San Dimas, Calif. 91773

Filed Jul. 14, 1999, Appl. No. 354,518

Int. Cl. F41B *11/00;* **F16K** *51/00*

U.S. Cl. 251—360 **14 Claims**



1. A method of repairing a connection valve in a pneumatically operated paint ball gun wherein the connection valve comprises a valve body, a valve body cover and a valve stem assembly disposed within the valve body and wherein the valve body cover has been damaged, the method comprising:

(a) providing a pneumatically operated paint ball gun comprising:

(i) a pressurized tank attached to the paint ball gun; and

(ii) a connection valve connecting the pressurized tank to the paint ball gun, the connection valve comprising:

(I) a valve body having first and second open ends;

(II) a valve body cover reversibly attached to the first end of the valve body, the valve body and the valve body cover cooperating to define an internal valve chamber, the valve body cover having an external face, an internal face, a valve stem opening and a valve body cover orifice, the internal face of the valve body cover comprising a valve seat, the valve body cover orifice being sized and dimensioned to accommodate an allen wrench tool; and

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US 6,409,151 B1

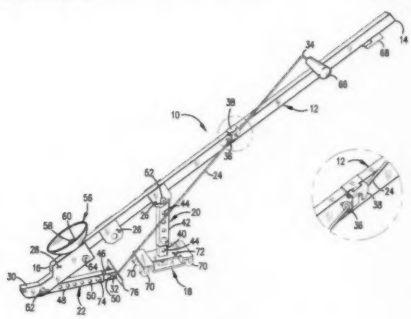
MECHANICAL JACK

Paul L. Cormier, P.O. Box 61, Spencer, Mass. 01562

Filed Aug. 29, 2001, Appl. No. 942,229

Int. Cl. B60P *1/48*

U.S. Cl. 254—8 R **22 Claims**



1. A mechanical jack comprising:

lifting means for lifting an object including a lever, a base and a fulcrum disposed between said lever and said base; and

supporting means for supporting the object being lifted including a post pivotally attached to said lever and a rod movably disposed between said post and said lever and said supporting means cooperating with said lifting means.

US 6,409,152 B1

METHOD AND APPARATUS FOR A TACK TOOL

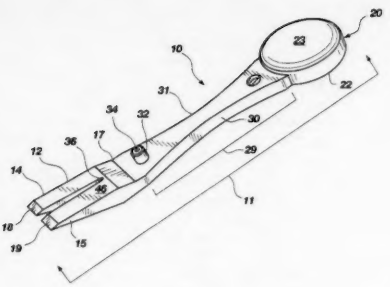
Jim M. Bagley, 801 W. Layton Ave. (1805 S.), Salt Lake City, Utah 84104

Filed Jul. 13, 2000, Appl. No. 615,136

Int. Cl. B25C *11/00*

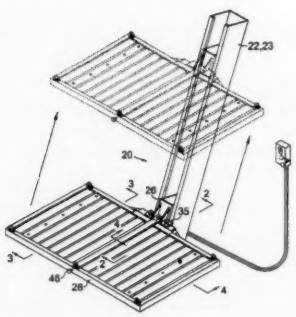
U.S. Cl. 254—18 **10 Claims**

1. A user operable, hand gripable, and storable apparatus for inserting, straightening, and removing a tack, comprising:



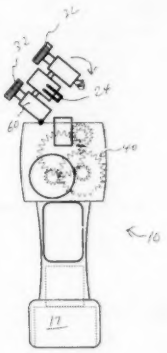
a) a forked wedge member;
b) a first cylindrical member;
c) an elongated member connectively disposed between said forked wedge member and said first cylindrical member;
d) said forked wedge member angularly disposed to a longitudinal length of said elongated member;
e) said first cylindrical member having one end closed, said closed end forming a closed convex portion thereto;
f) said elongated member having an aperture disposed therein, said aperture sized to receive a device for storing the apparatus;
g) a second cylindrical member coaxially disposed within said first cylindrical member, said cylindrical member having a first end coupled to an inner surface of the closed convex portion, and extending towards an open end of said first cylindrical member; and
h) a metallic retaining mechanism coaxially disposed within said second cylindrical member, said metallic retaining mechanism receiving the tack, the apparatus via the user's hand griping the apparatus operatively inserting the tack;
whereby the user's hand grips said elongated member pressing said convex portion into the palm, said forked wedge member via said user operatively extracting the tack.

US 6,409,153 B1
SMALL VEHICLE STORAGE LIFT
Kenneth D. Norris, 908 County Club La., Fort Worth, Tex. 76112-1936
Filed May 14, 2001, Appl. No. 853,549
Int. Cl. B66F *3/24*
U.S. Cl. 254—93 R **13 Claims**



1. A storage lift for lifting a small vehicle off a floor comprising:
an upright track having a base anchored to the floor;
a carriage slidably connected to the track;
a deck frame carried by the carriage, said deck frame having a center of gravity, and carried by and only by one longitudinal side portion of the deck frame; and
a deck lift means for motivating the carriage upwardly in the track thereby lifting the deck frame;
wherein a top portion of the upright track is tipped laterally away from a bottom portion of the upright track so that as the carriage lifts the deck frame, the deck frame's a center of gravity will tend to move above the base of the upright track.

US 6,409,154 B1
FISH TAPE FEED MECHANISM
Shawn A. Quinn, 701 W. Wright Ave., McHenry, Ill. 60050
Filed Dec. 6, 2000, Appl. No. 731,363
Int. Cl. B65H *57/28*
U.S. Cl. 254—134.3 FT **1 Claim**

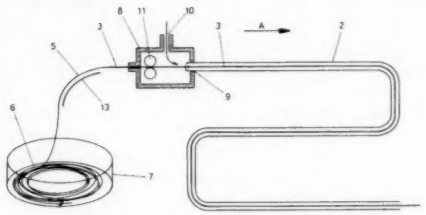


1. A fish tape feed mechanism for feeding and retracting an electrical feed tape through sections of electrical conduit; the fish tape feed mechanism comprising:
a housing;
an electrically powered motor drive assembly positioned within said housing and controlled by a user activated switch for controlling the direction and speed of said electrically powered motor drive assembly;
a fish tape drive assembly including a pair of non-electrically conductive idler wheels and a non-electrically conductive drive wheel that are configurable to frictionally grip and move a section of a fish tape by an adjustment mechanism for adjusting a gripping traction force between said fish tape drive assembly and a section of the fish tape; and
a drive mechanism mechanically linked between said electrically powered motor drive assembly and said non-electrically conductive drive wheel of said fish tape drive assembly and having a feed tape distance display including a microprocessor circuit programmed to utilize data input from an optical encoder mechanically linked to said fish tape drive assembly such that data from said optical encoder is processed into a fish tape feed distance by said microprocessor which then generates and transmits a set of display signals to a visual display device for continuously displaying the length of feed tape fed through said fish tape drive assembly;
a non-electrically conductive idler wheel of the pair of non-electrically conductive idler wheels of the fish tape drive assembly being mounted onto a pivoting bracket to allow for the lateral insertion of a section of feed tape between the one non-electrically conductive idler wheel and the non-electrically conductive drive wheel;
said pivoting bracket being pivotable into an open position to allow for lateral insertion of a section of the feed tape between said one of said pair of non-electrically conductive idler wheels and said non-electrically conductive drive wheel and pivoted and lockable into a closed operational position for use.

US 6,409,155 B1
METHOD OF INSERTING A LIGHT TRANSMITTING MEMBER INTO A TUBE

George Henry Platt Brown, Galashiels, and Steven King, Kelso, both of United Kingdom, assignors to Emtelle UK Limited, United Kingdom

PCT No. PCT/GB98/03643, § 371 Date Jun. 27, 2000, § 102(e) Date Jun. 27, 2000, PCT Pub. No. WO99/35525, PCT Pub. Date Jul. 15, 1999
PCT Filed Dec. 7, 1998, Appl. No. 582,550
Claims priority, application United Kingdom, Dec. 30, 1997, 9727411; Jan. 7, 1998, 9800144
Int. Cl. B65H *59/00*
U.S. Cl. 254—134.4 **21 Claims**



1. A method of inserting an elongate, flexible, light transmitting member into an elongate duct, the method comprising:

inserting an elongate, flexible, tensile member into the duct;

attaching the tensile member adjacent a rearward end thereof to the light transmitting member adjacent a forward end thereof;

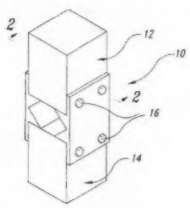
introducing the forward end of the light transmitting member into the duct; and

causing flow of fluid along the duct to cause the tensile member to move along the duct and the light transmitting member to move into the duct, wherein the tensile member in use is caused to move along the duct solely by said flow of fluid.

US 6,409,156 B2
BREAKAWAY BRACKET

Clifford Dent, P.O. Box 6007, Farmington, N. Mex. 87499

Division of application No. 09/181,231, filed on Oct. 27, 1998, now Pat. No. 6,210,066. This application Jan. 30, 2001, Appl. No. 774,467.
Int. Cl. E01F *15/00*
U.S. Cl. 256—13.1 **4 Claims**



1.A post assembly, comprising:

a base assembly anchored in the ground;

a post; and

a first breakaway bracket having a first end attached to the base assembly, a second end attached to the post, and a central section disposed between and integrally formed with the first and second ends, the central section extending outward from the first and second ends in a first direction to form a first and second shoulder, with the first and second ends, respectively, having a substantially planar exposed face that the base assembly and post bear against, the central section spanning the width of the brackets and having a channel formed thereacross with a V-shaped cross-sectional configuration to define a pre-formed break point that will fracture when subjected to a predetermined load through the first and second ends;

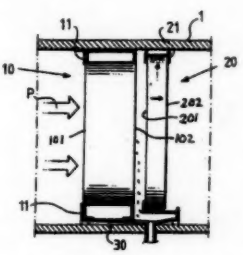
a second breakaway bracket having a first end attached to the base assembly, a second end attached to the post, and a central section disposed between and integrally formed with the first and second ends, the central section extending outward from the first and second ends in a first direction to form a first and second shoulder, with the first and second ends, respectively, having a substantially planar exposed face that the base assembly and post bear against, the central section spanning the width of the brackets and having a channel formed thereacross with a V-shaped cross-sectional configuration to define a pre-formed break point that will fracture when subjected to a predetermined load through the first and second ends; and

the first and second breakaway brackets cooperating whereby upon impact to the post, one of the first and second breakaway brackets will fracture and the other of the first and second breakaway brackets will bend about the breakpoint to maintain a connection between the post and the base assembly.

US 6,409,157 B1
AIR TREATMENT UNIT

Bertil Lundin, Sollentuna, Sweden; Geoffrey Bowers, Montville, Australia, and Patricia Tyson Thomas, Fort Myers, Fla., assignors to Munters AB, Sollentuna, Sweden

PCT No. PCT/SE98/02411, § 371 Date Sep. 7, 2000, § 102(e) Date Sep. 7, 2000, PCT Pub. No. WO99/32845, PCT Pub. Date Jul. 1, 1999
PCT Filed Dec. 21, 1998, Appl. No. 582,165
Claims priority, application Sweden, Dec. 22, 1997, 9704832; Jul. 8, 1998, 9802463
Int. Cl. B01F *3/04*
U.S. Cl. 261—94 **22 Claims**



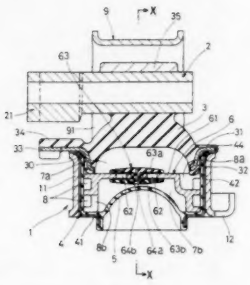
1. An air treatment unit for treatment of an air stream flowing in a substantially horizontal direction and being blown through the unit from an inlet side to an outlet side, said air stream interacting with water pouring downwardly through said unit comprising at least one pad having a substantially vertical inlet surface, an outlet surface and a plurality of narrow air-flow channels extending from said inlet surface to said outlet surface, the walls of said channels being formed by corrugated sheets of a stiff material, said sheets being positioned and fixed generally in mutually parallel, substantially vertical planes next to each other in such a way that the channels formed by the corrugations of any two adjacent sheets extend in two different directions from said inlet surface to said outlet surface, wherein:

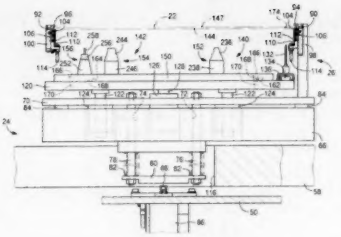
at least in a central major region of the pad, said mutually parallel, substantially vertical planes of said corrugated sheets are oriented obliquely relative to a substantially horizontal direction being normal to said inlet surface, whereby said air-flow channels extend obliquely, not only in said two directions in said mutually parallel planes, but also obliquely sideways in a third direction, as seen in said substantially horizontal, normal direction, as a consequence of said oblique orientation of said mutually parallel planes.

US 6,409,158 B1
LIQUID-FILLED TYPE VIBRATION ABSORBING DEVICE

Yukio Takashima, and Tsutomu Hashimoto, both of Osaka, Japan, assignors to Toyo Tire & Rubber Co., Ltd., Osaka, Japan

Filed Nov. 3, 2000, Appl. No. 705,358
Claims priority, application Japan, Jan. 27, 2000, 2000-018362
Int. Cl. B60K *5/12;* **F16F** *13/08*
U.S. Cl. 267—140.13 **8 Claims**





1. A liquid-filled type vibration absorbing device in which a vibration absorbing base made of a rubbery elastic member is interposed between a holding cylinder opened at top and bottom and part of a lower mounting metal fixture, and an upper mounting metal fixture of a thick cylindrical shape having an axis perpendicular to the axis of the device, and in which there are arranged in said holding cylinder a diaphragm made of a rubber film and directly facing the vibration absorbing base, and a partition member for partitioning the space between said vibration absorbing base and said diaphragm into two compartments, thereby to form two liquid chambers communicating with each other through an orifice, comprising:

an annular member having a flanged upper portion and a cylindrical lower portion and fixed on the outer circumference of the lower portion of said vibration absorbing base; and

an intermediate cylinder joined to said annular member,

wherein said diaphragm is attached to the lower end portion of said intermediate cylinder whereas the partition member is fitted in the inner circumference of the intermediate cylinder,

wherein said intermediate cylinder is fitted at its upper portion in the cylindrical lower portion of said annular member and is caulked and fixed at the outer edge portion of its upper end to the flanged upper portion of said annular member, thereby to form the liquid chambers individually between said partition member and both said vibration absorbing base and said diaphragm and to cause the two liquid chambers to communicate with each other through the orifice formed in the partition member, and

wherein said intermediate cylinder is press-fitted in said holding cylinder.

US 6,409,159 B1
METHOD OF SUPPORTING PRINTED CIRCUIT BOARD AND METHOD OF MOUNTING ELECTRIC COMPONENTS

Koichi Asai, Nagoya, and Shinsuke Suhara, Kariya, both of Japan, assignors to Fuji Machine Mfg. Co., Ltd., Chiryu, Japan

Filed Dec. 3, 1998, Appl. No. 204,311
Claims priority, application Japan, Jan. 9, 1998, 10-003076
Int. Cl. F16F *3/08*
U.S. Cl. 267—152 **19 Claims**

1. A printed-circuit-board supporting device for contacting at least two portions of a first one of opposite surfaces of a printed circuit board, and thereby supporting the printed circuit board on a side of the first surface, comprising:

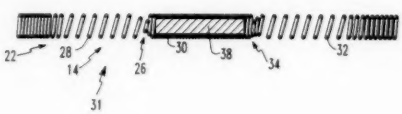
at least one support plate; and

at least two board supporting members which are fixable to at least two portions of the support plate, respectively, such that said at least two board supporting members contact and support said at least two portions of the first surface of the printed circuit board, respectively, and such that a vacant space is left between the board supporting members fixed to the support plate and supporting the printed circuit board, each of the board supporting members including a vibration damping portion formed of a vibration damping rubber.

US 6,409,160 B2
METHODS OF MANUFACTURING COILS AND APPARATUS FOR SAME

David A. Meier; Dean A. Pranger, both of Muskegon; Jerry Lee Wigren, Shelby; Ken Eugene Simons; Norman Edward Bradshaw, both of Muskegon; John R. Smith, Shelby, and Russell D. Sugarbaker, North Muskegon, all of Mich., assignors to Precision Products Group, Inc., Muskegon, Mich.

Continuation of application No. 09/378,121, filed on Aug. 19, 1999, now Pat. No. 6,264,183. This application Mar. 1, 2001, Appl. No. 798,645.
Int. Cl. F16F *1/06*
U.S. Cl. 267—169 **27 Claims**



1. A method of manufacturing a spring assembly comprising the steps of:

forming a first coil portion having a longitudinal axis and a first diameter measured laterally from the longitudinal axis;

forming a second coil portion adjacent to the first coil portion having a second diameter measured laterally from the longitudinal axis wherein the second diameter is smaller than the first diameter;

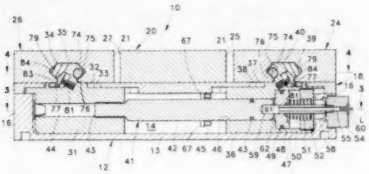
inserting a core into the first coil portion having a third diameter measured laterally from the longitudinal axis wherein the second diameter is smaller than the third diameter such that the second coil portion acts to contain the core within the first coil portion;

wherein the step of forming the second coil portion occurs before the step of inserting the core into the first coil portion.

US 6,409,161 B1
DOUBLE STATION HYDRAULICALLY OPERATED MACHINING VISE

Bradley D. Wolff, Fairport; Matthew T. Hoyt, Rochester, both of N.Y., and David L. Durfee, Jr., Meadville, Pa., assignors to Parlec, Inc., Fairport, N.Y.

Filed Feb. 22, 2001, Appl. No. 789,907
Int. Cl. B25B *5/16*
U.S. Cl. 269—43 **11 Claims**



1. In a two station machining device having a stationary jaw secured on the work surface of a housing between two movable jaws, and having a pair of spaced slides connected to said movable jaws and reciprocable in a recess in said housing beneath said work surface for moving the movable jaws between open and closed positions with respect to said stationary jaw, the improvement comprising

a piston in said recess extending between said slides with one end thereof secured to one of said slides, and with the other end thereof sealingly slidable in an axial bore in the other of said slides,

resilient means normally retaining said slides and said piston in first limit positions in which said movable jaws are in said open positions, and

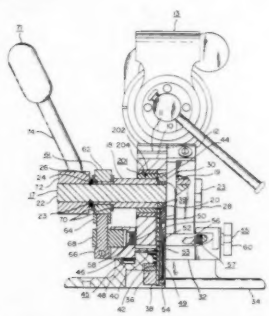
operating means for supplying hydraulic fluid under pressure to said bore in said other slide and operative initially to move said piston and said one slide relative to said other slide, and into second limit positions in which the jaw connected to said one slide is moved to its closed position,

said operating means being operative after said piston and said one slide have reached their second limit positions, to cause said other slide to be moved relative to said piston to a second position in which the jaw connected thereto is moved to its closed position relative to said stationary jaw.

US 6,409,162 B1
HINGE

David Herman Belusko, 10408 James Rd., Rochester, Wash. 98579

Filed Sep. 26, 2000, Appl. No. 669,810
Int. Cl. B25B *1/22*
U.S. Cl. 269—71 **9 Claims**

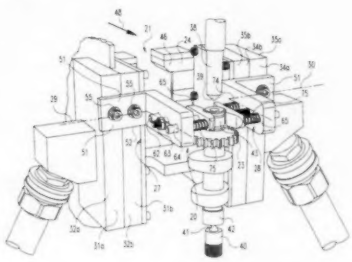


1. In an eccentrically immobilized hinge-type device, the combination comprising: a yoke-type device, having peripheral elements radially centered on said yoke-type device's axis, with each said element housing a bore on said axis, and said yoke-type device having an implement coupling element; an eccentric device having radially centered first peripheral elements individually disposed for cooperating with a said bore of said yoke-type device, and said eccentric device having at least one eccentric peripheral element disposed adjacent to each said first peripheral element; a connecting device, disposed for cooperating with all said eccentric peripheral elements of said eccentric device and all said peripheral elements of said yoke-type device, and having another implement coupling element; and an activating means for said eccentric device, such that, upon activation it controls the hinging ability between said yoke-type device and said connecting device.

US 6,409,163 B1
FIXTURING DEVICE FOR HOLDING A WORKPIECE

Max E. Stewart, Plainfield, Ind., assignor to Contour Hardening, Inc., Indianapolis, Ind.

Filed Jun. 20, 2000, Appl. No. 597,100
Int. Cl. B23Q *3/18*
U.S. Cl. 269—224 **12 Claims**



1. A fixturing device for holding a workpiece for processing by a machine comprising:

a first subassembly constructed and arranged to be attached to a movable portion of said machine;

a second subassembly constructed and arranged to be attached to said movable portion;

said first subassembly and said second subassembly each including an attachment member, a holding block, connecting means for connecting said holding block to said attachment member with a predetermined spacing between said holding block and said attachment member and spring biasing means for spring loading said holding block at said predetermined spacing;

said connecting means and said spring biasing means being constructed and arranged to permit movement of said holding block toward said attachment member; and

said first and second subassemblies being constructed and arranged to be attached to said movable portion such that the holding block of said first subassembly and the holding block of said second subassembly are directed at each other and spaced apart so as to define a workpiece-receiving region therebetween.

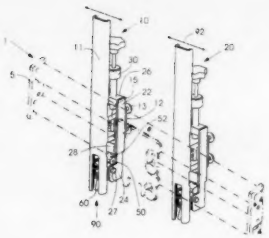
US 6,409,164 B1
FEEDER PILE RESTRICTOR AND METHOD

Andrew Lynn Klopfenstein, Tipp City, and Russell Alan Bechler, Bellbrook, both of Ohio, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Apr. 28, 2000, Appl. No. 561,468
Int. Cl. B65H *3/34*
U.S. Cl. 271—104 **13 Claims**

1. A pile restrictor for a feeder having an operating mode, the pile restrictor comprising:

a restrictor body;



a restricting blade rotatably supported in the body so as to be adjustable angularly with respect to the body during the operating mode; and

a support, the restrictor body being movably connected to the support during the operating mode so as to permit a translational movement of the restricting blade supported in the restrictor body with respect to the support.

US 6,409,165 B1

SHEET HOLDER AND SHEET TRAILING EDGE RESTRICTION MEMBER THEREFOR

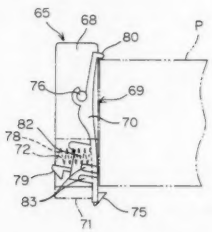
Masanori Yamaoka; Yuji Nakayashiki, and Hiroyuki Tanaka, all of Osaka, Japan, assignors to Kyocera Mita Corporation, Osaka, Japan

Filed Aug. 4, 2000, Appl. No. 633,267

Claims priority, application Japan, Aug. 6, 1999, 11-223669

Int. Cl. B65H *1/00*

U.S. Cl. 271—145 **6 Claims**



1. A sheet holder for holding a multiplicity of sheets for use in an image forming apparatus, the sheet holder comprising:

a sheet holding portion on which the sheets are stacked; and

a restriction member detachably mounted in a predetermined position depending on a sheet size in the sheet holding portion for positioning a rear end of the sheet stack held in the sheet holding portion,

wherein the restriction member comprises:

a main body disposed upright in the sheet holding portion;

a hook extending alongside the main body with a predetermined space defined therebetween for fixing the main body to the sheet holding portion, the hook being deformable toward the space so as to be brought into and out of engagement with the sheet holding portion;

a rear support plate forwardly displaceable from the main body so that, when the sheet stack has a greater thickness with a greater number of sheets held in the sheet holding portion, the rear support plate is pressed against the main body by the rear end of the sheet stack thereby to be substantially flush with the main body and, as the number of the sheets is reduced, the rear support plate is displaced forward from the main body to support the rear end of the sheet stack; and

an insert projecting from the rear support plate to be inserted in the space between the main body and the hook, the insert being movable in accordance with the displacement of the rear support plate so as to be brought out of the space when the rear support plate is displaced to a forward terminal position.

US 6,409,166 B1

SHEET RECEIVING APPARATUS

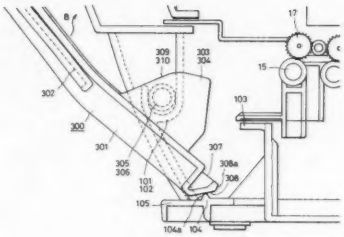
Makoto Kashimura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 2000, Appl. No. 567,984

Claims priority, application Japan, May 12, 1999, 11-131191

Int. Cl. B65H *31/04;39/10*

U.S. Cl. 271—213 **35 Claims**



1. A sheet receiving apparatus comprising:

a tray rotatably supported about a center of rotation by an apparatus main body to be selectively positioned in a use position, in which sheets can be loaded thereon, and in an accommodation position; and

a regulation unit abuttable against said tray for regulating a rotational motion thereof when said tray is in the accommodation position to maintain said tray in the accommodation position,

wherein the center of rotation of said tray is arranged movably and said tray is shifted from the accommodation position to the use position by permitting the rotational motion thereof, regulated by said regulation unit, by moving the center of rotation thereof in a direction transverse to the axis of the center of rotation.

US 6,409,167 B1

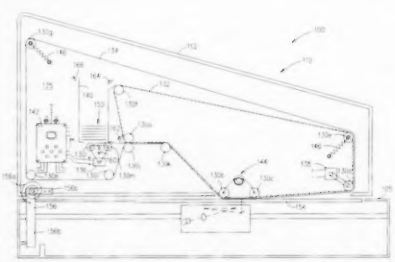
PHOTOGRAPHIC PRINT FEEDER FOR SCANNER OR COPIER

David D. Bohn, Fort Collins, Colo., assignor to Hewlett-Packard Co., Palo Alto, Calif.

Filed Jan. 27, 2000, Appl. No. 492,970

Int. Cl. B65H *3/06*

U.S. Cl. 271—227 **14 Claims**



1. An apparatus for positioning a plurality of documents over a scanning surface, comprising:

a peripheral device having a scanning surface;

a component housing positioned over the scanning surface and comprising:

an inner belt;

an outer belt that interacts with the inner belt adjacent the scanning surface;

a belt motor for circulating the inner belt;

a tray for containing the plurality of documents;

a roller sensor to indicate when the tray contains a document; and

a roller motor for moving each document of the plurality of documents contained by the tray to a location where the inner and outer belts can interact with the document.

US 6,409,168 B1

DEVICE FOR TRANSFORMING AN OVERLAPPING STACK OF OBJECTS INTO AN OVERLAPPING ARRANGEMENT

Willy Leu, Pfäffikon, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

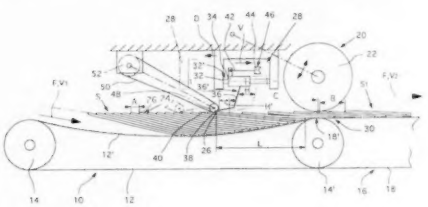
PCT No. PCT/CH98/00557, § 371 Date Jun. 22, 2000, § 102(e) Date Jun. 22, 2000, PCT Pub. No. WO99/35071, PCT Pub. Date Jul. 15, 1999

PCT Filed Dec. 29, 1998, Appl. No. 582,124

Claims priority, application Switzerland, Dec. 30, 1997, 2982/97

Int. Cl. B65H *5/34*

U.S. Cl. 271—270 **15 Claims**



1. Apparatus for converting the formation of sheet-like articles which are fed on a first conveyor driven at a first conveying speed and, by a displacement arrangement are transferred individually from a first formation into an imbricated formation and into an active region of a second conveyor, driven at a second conveying speed, which is greater than the first conveying speed, wherein the displacement arrangement has a displacement member which is provided with a hook and, by means of a drive and a guide means can be displaced cyclically in an operating region, at least more or less in the conveying direction of the first conveyor, at a speed which is greater than the first conveying speed, such that the sheet-like articles in the first formation, which forms an imbricated stack, can be gripped individually by the hook and transferred to the second conveyor, and into the imbricated formation.

US 6,409,169 B1

TABLE HOCKEY APPARATUS

Josef Beat Sutter, Gerbistrasse 10, CH-8730 Uznach, Switzerland

PCT No. PCT/IB98/00648, § 371 Date Apr. 10, 2000, § 102(e) Date Apr. 10, 2000, PCT Pub. No. WO98/27801, PCT Pub. Date Jul. 2, 1998

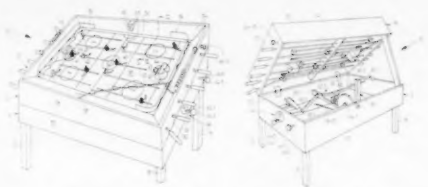
PCT Filed Apr. 28, 1998, Appl. No. 423,088

Claims priority, application Switzerland, May 2, 1997, 1035/97

Int. Cl. A63F *7/06*

U.S. Cl. 273—108.1 **22 Claims**

1. A table hockey game apparatus having a puck transfer device bringing a puck on to a horizontal playing field through a puck



insertion opening situated in an area of a center line of the playing field from puck passages arranged in an area of goal installations, wherein the puck transfer device is an entirely mechanical, and an entirely mechanically controlled manually operable device.

US 6,409,170 B1

GAMING MACHINE

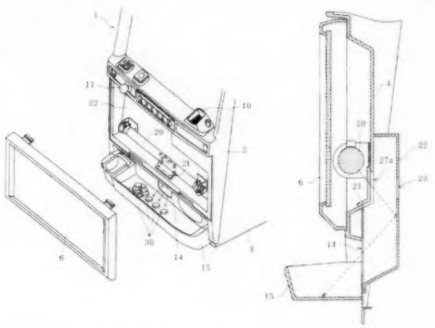
Kiyoshi Sugimoto, Tokyo, Japan, assignor to Aruze Corporation, Tokyo, Japan

Filed Dec. 16, 1998, Appl. No. 212,448

Claims priority, application Japan, Dec. 18, 1997, 9-349512

Int. Cl. A63F *5/04; 7/02*

U.S. Cl. 273—143 R **11 Claims**



1. A gaming machine having an outlet for paying out gaming media, and a receiver for receiving the paid-out gaming media, the receiver being disposed outward of the outlet with respect to the gaming machine, the gaming machine comprising:

an illumination arrangement for emitting light;

a first light path for defining a first path of propagation of a first portion of the light issued by said illumination arrangement, said first path of propagation extending to the receiver;

a second light path for defining a second path of propagation of a second portion of the light issued by said illumination arrangement;

an aperture disposed in the first path of propagation for introducing the light emitted by said internal light source into the interior of the outlet; and

a reflection surface for reflecting the light toward the outlet, thereby illuminating the receiver from the interior of the outlet.

US 6,409,171 B1

METHOD AND APPARATUS FOR PLAYING GOLF TRIVIA GAME

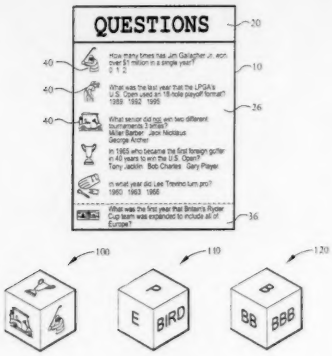
Scott Schultz, 131 Charles St., and Robert Davidson, 2509 Hirst Ter., both of Havertown, Pa. 19083

Filed Jul. 8, 1998, Appl. No. 111,940

Int. Cl. A63F *3/00*

U.S. Cl. 273—245 **9 Claims**

1. A method of play of a golf trivia game, comprising the steps of:


QUESTIONS
20
How many times has Jim Gallagher Jr. won over $1 million in a single year?
0 1 2
40
10
What was the last year that the LPGA's U.S. Open used an 18-hole playoff format?
1989 1992 1995
40
26
What senior did not win two different tournaments 3 times?
Miller Barber Jack Nicklaus
George Archer
40
In 1965 who became the first foreign golfer in 40 years to win the U.S. Open?
Tony Jacklin Bob Charles Gary Player
In what year did Lee Trevino turn pro?
1960 1963 1966
36
What was the first year that Britain's Ryder Cup team was expanded to include all of Europe?
100
110
120
E
BIRD
BB
BBB

randomly selecting a question category from one of a plurality of question categories;

directing a question pertaining to the game of golf from said selected category to a player;

assigning a value, at least in part randomly, to an incorrect answer;

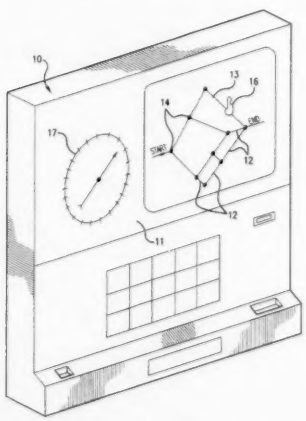
assigning a value, at least in part randomly, and independently from the step of assigning a value to an incorrect answer, to a correct answer;

determining whether the answer given by the player is correct; and

determining whether the answer given by the player is correct; and

recording a score equal to the value of the answer.

US 6,409,172 B1
METHODS AND APPARATUS FOR A CASINO GAME
Olaf Vancura, 4684 Stuttgart St., Las Vegas, Nev. 89147
Filed Sep. 8, 2000, Appl. No. 659,430
Int. Cl. A63B *53/06;53/16*
U.S. Cl. 273—256 **32 Claims**



1. A method for playing a casino game of chance for a bet with random entry from an underlying slot machine to a bonus game of the casino game of chance, the method for playing a casino game comprising the steps of:

a) establishing a plurality of paths in the play of the bonus game of the casino game of chance, each of which path is comprised of a plurality of positions;

b) establishing a random means of traversing the paths in the play of the bonus game of the casino game of chance;

c) presenting with the random means the possibility of two or more moves being required to complete the bonus game;

d) allowing a player to select one of the paths in the play of the bonus game of the casino game of chance;

e) moving according to the random means along a selected path by the player;

f) providing at least one position having a win or loss outcome;

g) awarding the player monetary or credit values based upon wins or losses associated with positions landed upon, and

h) relating a random frequency of the bonus game to the probability of landing on each position and to the value of each position so a predetermined range for a house advantage is maintained in the casino.

US 6,409,173 B1
METHOD AND APPARATUS FOR PLAYING A MULTI COMPONENT WAGERING GAME
George Tri, Sandstone, Minn., assignor to Corporate Commission of Mille Lacs Band of Ojibwe Indians, Onamia, Minn.
Filed Jan. 18, 2000, Appl. No. 483,882
Int. Cl. A63F *1/00;3/06*
U.S. Cl. 273—292 **20 Claims**

3. A method of playing a card game comprising:

playing a card game, the card game including a single dealer and a first set of players, wherein the dealer provides a plurality of cards to each of the first set of players, the cards received by each of the first set of players dependent on the cards dealt by the single dealer;

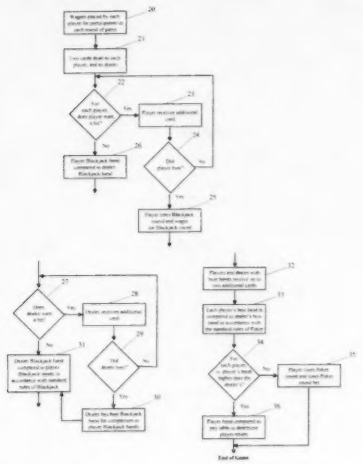
playing a board game which includes a plurality of boards, the board game played by a second set of players, each board including a plurality of squares thereon, each of the squares listing one of a plurality of predetermined arrangements of playing cards obtainable in the card game wherein a square of a board is marked when a predetermined arrangement of playing cards is obtained during the card game.

US 6,409,174 B1
21 DRAW POKER GAME
Phillip W. Demarest, 2488 Hoops Ave., Henderson, Nev. 89102
Provisional application No. 60/161,913, filed on Oct. 28, 1999. This application Oct. 26, 2000, Appl. No. 696,192.
Int. Cl. A63F *1/00*
U.S. Cl. 273—292 **23 Claims**

1. A method for at least one player and a dealer to play a card game with a plurality of cards, the card game including a Blackjack round and a Poker round, the method comprising:

playing the Blackjack round in accordance with rules of Blackjack, the Blackjack round including:

sequentially dealing a first card to each player and a first card to the dealer;



sequentially dealing a second card to each player and a second card to the dealer;

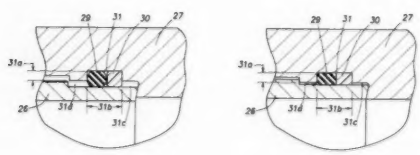
dealing additional cards to each of the at least one player and the dealer selecting to receive additional cards, in accordance with the rules of Blackjack, such that each player has a player Blackjack round hand and the dealer has a dealer Blackjack round hand;

playing the Poker round in accordance with rules of Poker, wherein each player participating in the Poker round plays with the player Blackjack round hand, and the dealer plays with the dealer Blackjack round hand, the Poker round including:

only for each player and the dealer having a bust hand in the Blackjack round, dealing up to two additional cards to the bust hand player and the dealer, such that each player participating in the Poker round and the dealer receiving the up to two additional cards has no more than five cards, wherein each player participating in the Poker round and the dealer have a Poker round hand; and

determining whether each participating player wins the Blackjack round and the Poker round.

US 6,409,175 B1
EXPANDABLE JOINT CONNECTOR
M. Edward Evans, Spring; D. Scott Costa, Kingwood, and James N. Brock, The Woodlands, all of Tex., assignors to Grant Prideco, Inc., The Woodlands, Tex.
Filed Jul. 13, 1999, Appl. No. 352,815
Int. Cl. F16L *17/00*
U.S. Cl. 277—314 **46 Claims**



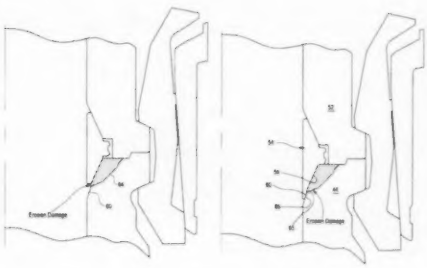
1. A method for sealing a connection between adjoining tubular bodies comprising:

threadably engaging a threaded axial end of a first tubular body within a threaded axial end opening of a second tubular body whereby an annular area is defined between said first and said second tubular bodies;

disposing a sealing component in said annular area between said first and second tubular bodies; and

radially expanding said first and said second tubular bodies to compress said sealing component between said first and second tubular bodies to seal the annular area between said first and second tubular bodies.

US 6,409,176 B2
WELLHEAD HOUSING SEAL ASSEMBLY WITH BACKUP FEATURE
Timothy J. Allen, Houston, Tex., assignor to Cooper Cameron Corporation, Houston, Tex.
Filed Oct. 5, 1998, Appl. No. 166,379
Int. Cl. E21B *33/128;* **F16L** *17/06;55/00*
U.S. Cl. 277—340 **31 Claims**



1. In combination, a tubular connection, capable of accepting different gaskets for primary and secondary sealing, when connecting a first and second members, and at lest one gasket comprising:

a first and second member connectable to each other wherein at least one of said members further comprises a tubular body having a bore along its longitudinal axis and a primary sealing surface and a secondary sealing surface separated by a transition surface, wherein all said surfaces circumscribe said bore;

a secondary gasket usable to seal said first and second members against said secondary sealing surface after said primary sealing surface is no longer functional for effective sealing and mutually exclusive of the primary seal;

a receptacle defined between the members when assembled to each other; and an extending member extending from said gasket and loosely mounted in said receptacle solely to locate said secondary gasket to allow said secondary gasket to make sealing contact with said secondary sealing surface.

US 6,409,177 B1
ROTARY SHAFT SEAL
David E. Johnston, East Hebron, N.H., assignor to Freudenberg-Nok General Partnership, Plymouth, Mich.
Provisional application No. 60/150,273, filed on Aug. 23, 1999. This application May 31, 2000, Appl. No. 583,840.
Int. Cl. F16J *15/32*
U.S. Cl. 277—551 **39 Claims**

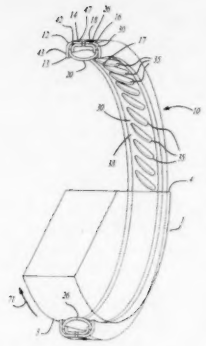
1. A shaft seal for sealing fluid about a shaft, said shaft seal comprising:

a first support member;

a second support member adjacent to but spaced away from said first support member;

a membrane attached to each of said first and second support members, said membrane having a surface adjacent to the shaft; and

a plurality of waves formed on said surface in response to movement of said first support member relative to said second



support member, said plurality of waves forming a pumping spiral to pump back any migrating fluid along the shaft.

US 6,409,178 B1

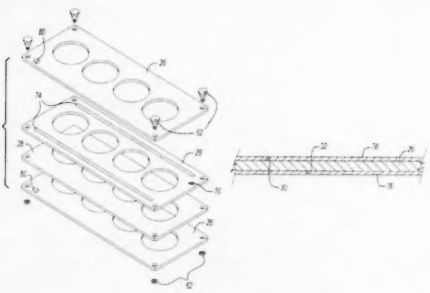
MULTIPLE LAYER GASKET HAVING SELECTIVELY REMOVABLE SPACER LAYERS AND VISUAL INDICATORS

Edward Raden, Downers Grove, and William A. Johnson, Naperville, both of Ill., assignors to Dana Corporation, Toledo, Ohio

Continuation-in-part of application No. 09/328,746, filed on Jun. 9, 1999. This application Dec. 30, 1999, Appl. No. 475,924.

Int. Cl. F16J *15/08*; **F02F** *11/00*

U.S. Cl. 277—592 **23 Claims**



1. A metallic gasket assembly for use in sealing mating components in an internal combustion engine and permitting selective variation of the compression ratio of the engine, said gasket assembly comprising:

at least two active layers, a first active layer and a second active layer, each having a plurality of active layer apertures formed therethrough and an active layer thickness defined by opposing top and bottom faces;

a central layer having a plurality of central layer apertures formed therethrough and a central layer thickness defined by opposing top and bottom faces; said central layer apertures corresponding to said active layer apertures;

at least one spacer layer having a plurality of spacer layer apertures formed therethrough and a spacer layer thickness defined by opposing top and bottom faces, said spacer layer apertures corresponding to said active and central apertures;

said active, central and spacer layers being arranged in face-to-face engagement with said central layer being positioned between said active layers with two of said active layers serving as outermost mounting surfaces of said gasket assembly such that said respective central and active layer apertures are aligned, wherein said at least one spacer layer is positioned between said central layer and one of said active layers such that said spacer layer apertures are aligned with said active and central layers;

wherein said active, central and spacer layers are removably engaged in face-to-face engagement such that one or more spacer layers may be selectively added or removed from said gasket assembly in a non-destructive manner to selectively vary the compression ratio of the engine when said gasket assembly is operatively connected to the vehicle engine; and

wherein at least one of said central layer, active layers or said spacer layer is provided with a visual indicator to allow for distinguishing between said central layer, active layers and said spacer layer during selective assembly or re-assembly said gasket assembly to achieve varied compression ratios for the vehicle engine when said gasket assembly is operatively connected to the vehicle engine.

US 6,409,179 B1

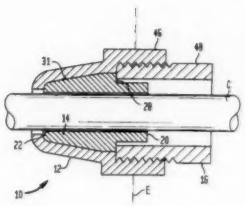
CABLE SEALING ARRANGEMENTS AND SEALING MEMBERS FOR USE THEREIN

Bassel Hage Daoud, Parsippany, N.J., assignor to Avaya Technology Corp., Basking Ridge, N.J.

Filed Feb. 9, 2000, Appl. No. 500,714

Int. Cl. F16L *21/02*; **H02G** *15/04*

U.S. Cl. 277—602 **11 Claims**



1. A sealing arrangement for sealing about a cable, said arrangement comprising:

a tubular fitting having an inner surface defining a inner passage extending therethrough dimensioned to receive a cable;

a unitary sealing member having first and second portions, and a channel extending therethrough formed to accommodate a cable, said first portion having first and second ends, said first end being formed to be received in said inner passage with a portion of said sealing member being formed to shapematingly engage said fitting, said second portion extending from said second end of said first portion, said second portion being smaller than said first portion such that said second end of said first portion defines a contact surface unobstructed by said second portion; and,

a nut mountable to said fitting, said nut having a compression surface for engaging said contact surface with said first end of said first portion being received in said fitting;

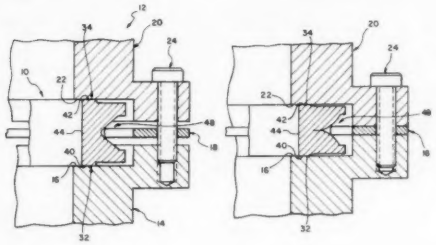
wherein said sealing member comprises a body having a first inner surface and an outer surface, said first inner surface defining a first channel extending the length of said body, wherein a first slit is formed to extend between and through said first inner surface and said outer surface such that portions of said body adjacent to said first slit may be displaced to expose portions of said first channel.

US 6,409,180 B1

METALLIC SEAL

John Loyd Spence, Severna Park, and Kevin R. Felber, Bowie, both of Md., assignors to PerkinElmer, Inc., Wellesley, Mass.

Filed Apr. 21, 2000, Appl. No. 556,815
Int. Cl. F16J *15/02*
U.S. Cl. 277—608 **22 Claims**



1. A metallic seal comprising:

a first annular beam section having a first non-sealing surface and a first raised portion, said first raised portion having a first annular sealing surface facing in a first axial direction to contact a first member for creating a first annular sealing dam therebetween;

a second annular beam section having a second non-sealing surface and a second raised portion, said second raised portion having a second annular sealing surface facing in a second axial direction, which is opposite to said first axial direction, to contact a second member for creating a second annular sealing dam therebetween;

an annular inner surface extending between said first and second sealing surfaces to form a central passageway;

an annular outer surface extending between said first and second sealing surfaces and spaced from said annular inner surface to form an annular column section of material extending substantially perpendicular between said first and second annular beam sections thereto; and

one of said annular inner and outer surfaces having annular recess extending in a substantially radial direction to at least partly define an effective minimum width of said annular column section,

at least a part of said first sealing surface of said first raised portion and at least a part of second sealing surface of said second raised portion being axially aligned with said annular column section, said first and second non-sealing surfaces being axially aligned with said annular recess and extending radially from said one of said annular inner and outer surfaces having said annular recess.

US 6,409,181 B1

COMBINATION TYPE ELECTRIC DRILL CHUCK STRUCTURE

Chun Chu Hsueh, No. 129, Mei-Feng, Xue-Jia Town Tainan Hsien, Taiwan

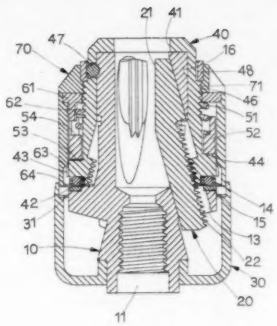
Filed Jul. 19, 2000, Appl. No. 619,706
Int. Cl. B23B *31/12*
U.S. Cl. 279—62 **12 Claims**

1. A combination type electric drill chuck structure, said chuck comprising:

a drive body that is generally a cylindrical shaft having head and tail ends, the middle thereof being provided with a plurality of inclined grooves for receiving multiple clamp pawls;

a fixed shell that is a generally U-shaped shell having upper and lower openings, said lower opening being provided with a securing hole for securing to said tail end of said drive body in tight fit;

a sleeve threaded seat that is a generally inverted-U shaped seat having upper and lower openings, and that is threadedly



provided at said head end of said drive body for engagement with said clamp pawls, a middle thereof being provided with outer threads;

a percussion ring unit provided with a spring and a percussion ring and fitted on said sleeve threaded seat;

a movable shell fitted on said percussion ring unit, an upper opening thereof matching fittingly an annular cap, said annular cap being subjected to action of said spring to form an abutting face during displacement of said movable shell; and

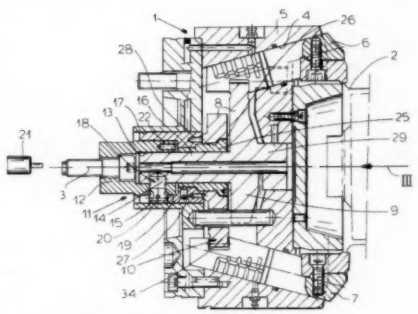
an adjusting ring provided within inner threads to be mounted threadedly on said sleeve threaded seat so as to abut against said annular cap of said movable shell.

US 6,409,182 B1

LATHE CHUCK WITH TWO SETS OF JAWS

Johann Taglang, Medlingen, Germany, assignor to Rohm GmbH, Sontheim, Germany

Filed May 4, 2000, Appl. No. 564,482
Claims priority, application Germany, May 5, 1999, 199 20 763
Int. Cl. B23B *31/16;31/12*
U.S. Cl. 279—132 **10 Claims**



1. A lathe chuck comprising:

a chuck body rotatable about an axis and having a plurality of angularly equispaced and axially forwardly open angled guides;

a set of first jaws in some of the guides;

a set of second jaws in the other guides alternating with the first jaws;

respective first and second actuating plates coupled to the respective sets of jaws and axially displaceable to radially displace the jaws in the guides;

an actuating shaft axially displaceable in the body and having a tubular front end formed with a radially throughgoing hole; and

means including

a core shaft axially connected to one of the plates, formed with a seat aligned radially with the actuating-shaft end hole,

a tube shaft axially connected to the other of the plates, formed with a seat aligned radially with the actuating-shaft end hole, and

a rocker extending through the hole, having ends engaged in the seats, and connecting the shaft with the plates

for limited relative axial movement of the plates, whereby the first jaws can engage the workpiece before the second jaws.

US 6,409,183 B1

REINFORCED ELONGATE METAL BODY

Geert Wemmenhove, Noetselerbergweg 43, NL-7441, BJ Nijverdal, Netherlands

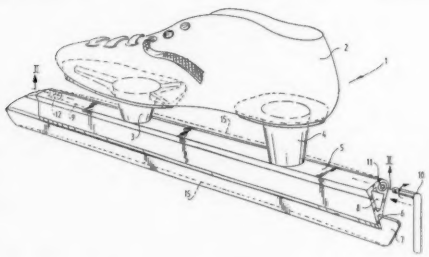
Division of application No. 08/973,358, filed as application No. PCT/NL96/00217, filed on Jun. 3, 1996, now Pat. No. 6,086,084. This application Jun. 9, 2000, Appl. No. 591,703.

Claims priority, application Netherlands, Jun. 2, 1995, 1000493

This patent is subject to a terminal disclaimer.

Int. Cl. A63C *5/07*

U.S. Cl. 280—11.18 **22 Claims**



1. An article of manufacture, comprising:

an elongate metal body of a chosen cross-sectional form, the body having at least one cavity of a chosen cross-sectional geometry extending substantially in a longitudinal direction; and

a pre-manufactured elongate reinforcing rod received in the at least one cavity;

wherein the reinforcing rod is connected to the body by glue;

wherein the reinforcing rod is connected to the body substantially along its entire outer surface; and

wherein the glue has a plurality of particles added thereto.

US 6,409,184 B1

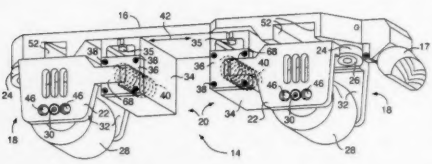
IN-LINE SKATE WITH SPRING CENTERING WHEELS

Ambrogio Giannini, 115 Van Horn St., West Springfield, Mass. 01089

Filed Aug. 22, 2001, Appl. No. 935,326

Int. Cl. A63C *1/00*

U.S. Cl. 280—11.233 **19 Claims**



1. A skate device comprising:

a foot support device; and

a truck assembly for supporting the foot support device, the truck assembly having:

a first spring housing fixedly attached to the foot support device, the first spring housing having a spring cavity, and a spring housing plate removably mounted to one side of the first spring housing, the spring housing having a clearance slot extending laterally therethrough including the spring housing plate,

a centering spring removably mounted within the spring cavity and retained therein with the spring housing plate,

a first wheel housing pivotally mounted to the foot support device and having a pair of arms extending longitudinally through the clearance slot of the first spring housing to straddle the centering spring therebetween, and

a first wheel having a first axle mounted to the first wheel housing for rotation about a first wheel axis;

wherein the centering spring pivotally urges the first wheel housing, with the first wheel rotatably mounted therein, toward a predetermined first center position for rotational movement in a longitudinal direction of the skate device; and

wherein the centering spring may be changed by removing the first spring housing plate from the first spring housing and pivoting the first wheel housing to expose the centering spring.

US 6,409,185 B1

ROLLER SKATE WITH REMOVABLE BOOT

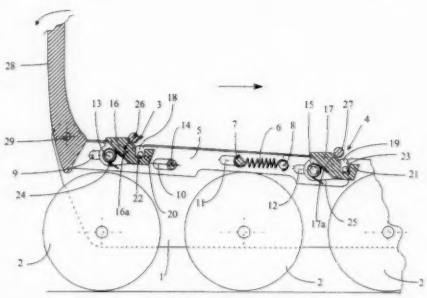
Sebastiano Savietto, Gaetano Montebelluna, Italy, assignor to Skis Rossignol S.A., Voiron, France

Filed Sep. 30, 1999, Appl. No. 409,133

Claims priority, application France, Oct. 1, 1998, 98 12514

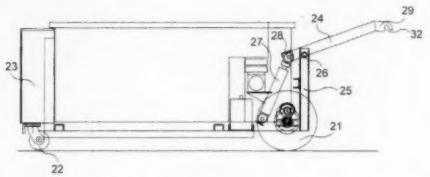
Int. Cl. A63C *1/00*

U.S. Cl. 280—11.27 **6 Claims**



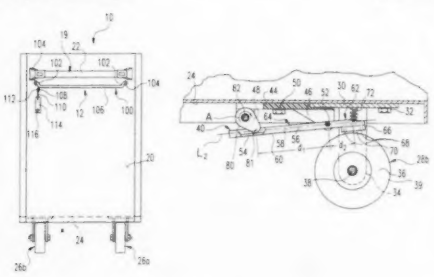
1. A roller skate comprising a chassis equipped with rollers and a boot removably attached to the chassis, the sole of which has a pair of bars or two pairs of tenons for attaching the boot to the chassis at two points located respectively in the heel region and in the front region of the foot, so that these bars, or tenons, catch in a catching element which is common to the two bars or tenons, the catching element being mounted to slide longitudinally on or in the chassis and biased by a spring which tends to keep the catching element in the captured position, the catching element automatically catching on the bars or tenons when the bars or tenons are pressed down onto the chassis, wherein the chassis is equipped, at least at one boot-attachment point, with an elastically retractable abutment, this abutment being displaced away from engagement with the catching element by a bar or tenon of the boot when the boot is being put on, so as to allow the catching element to catch on the bars or the tenons.

US 6,409,186 B2
MOBILE CART
Eugene Kevin Bennington, 1715 E. Fowler Ave., Suite 221, Tampa, Fla. 33612
Continuation-in-part of application No. 09/000,587, filed on Dec. 30, 1997, Provisional application No. 60/109,699, filed on Nov. 24, 1998. This application Feb. 1, 1999, Appl. No. 240,996.
Int. Cl. B62D *51/04*; **B60P** *1/34*
U.S. Cl. 280—43.23 **32 Claims**



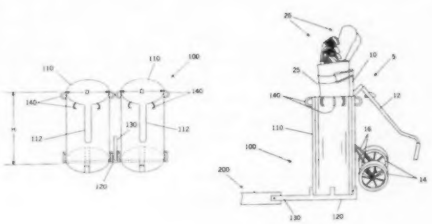
1. A mobile cart, comprising:
a housing;
a means for raising and lowering said housing;
a means for moving said cart on a ground surface, and
a means for self-loading said cart onto and self-unloading said cart from a raised platform, wherein said means for raising and lowering said housing comprises at least one extendable support structure which is adapted to extend and retract from said housing such that when one of said at least one extendable support structure extends from said housing said one of said at least one extendable support structure first contacts the ground and then raises a portion of said housing, wherein said means for self-loading said cart onto and self-unloading, said cart from the raised platform comprises at least one front lift arm attached to said housing, wherein said front lift arm is adapted to contact the raised platform and lift a front end of said cart housing and move said cart toward the raised platform until a portion of the cart housing is above the raised platform, wherein a distal end of said at least one front lift arm having a means for engaging a pin secured to the raised platform wherein when said at least one front lift arm engages the pin secured to the raised platform, the pin secured to the raised platform provides a basis for said at least one lift arm to raise said cart housing and move said cart toward the raised platform.

US 6,409,187 B1
BRAKE SYSTEM FOR A CART
Harvey L. Crow, Jr., Evansville, Ind., assignor to FKI Industries Inc., Fairfield, Conn.
Filed Nov. 29, 1999, Appl. No. 450,455
Int. Cl. B62B *5/04*
U.S. Cl. 280—47.34 **24 Claims**



1. A movable cart, comprising:
a frame;
at least two wheels rotatably attached to said frame;
a brake mechanism including a lever arm pivotally coupled to said frame to allow pivotal movement of said lever arm about a pivot axis, said lever arm being disposed in a substantially horizontal orientation and having first and second portions disposed on opposite sides of said pivot axis, said lever arm having a braked position wherein said first portion is pressure-loaded against one of said wheels to inhibit rotation thereof;
a brake release mechanism including a cam member rotatably coupled to said frame and disposed adjacent said second portion of said lever arm;
an actuator attached to said frame and being operatively coupled to said cam member; and
wherein actuation of said actuator imparts rotational movement to said cam member, said rotational movement causing said cam member to engage said second portion of said lever arm and pivot said lever arm to a released position wherein said first portion of said lever arm is disengaged from said one of said wheels to permit rotation thereof.

US 6,409,188 B1
CARRYING APPARATUS FOR GOLF BAG PULL CART AND GOLF BAG
Ronald G. Hesmer, Wilmington, N.C., assignor to Ron Hesmer, Wilmington, N.C.
Filed Feb. 2, 2000, Appl. No. 495,958
Int. Cl. A63B *55/08*
U.S. Cl. 280—79.5 **10 Claims**



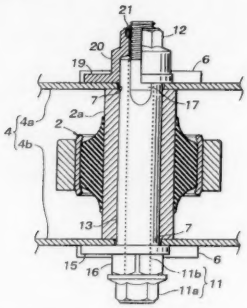
1. A carrier for a golf bag having an attached pull cart, the pull cart having a longitudinal support member releasably connected to said golf bag and a pair of wheel assemblies having leg members pivotally connected at a hinge member to said support member at least said predetermined distance above the lower surface of said golf bag said carrier comprising: a right cylindrical receiver having a circular base at a lower end and an open upper end, said receiver having an inner surface defining a vertically extending, upwardly opening cylindrical recess for vertically downwardly receiving said golf bag and supporting a lower surface of said golf bag on said base in a carrying position, said cylindrical recess having a diameter of about 12 inches and a length of about 24 inches; radially projecting attaching means connected at said lower end of said receiver for mounting at the rear of a vehicle; and an outwardly and upwardly opening longitudinal slot formed in said receiver communicating with said recess opposite said attaching means and extending from said upper end and terminating a predetermined distance above said base, said slot having a width sufficient for slidably receiving said leg members as said golf bag and said support member are inserted into said recess with said wheel assemblies disposed exterior of said receiver.

US 6,409,189 B1

SUSPENSION ARM MOUNTING STRUCTURE

Yukihiro Orimoto; Ryoji Nakagawa, and Tuyoshi Funano, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1999, Appl. No. 377,147
Claims priority, application Japan, Aug. 21, 1998, 10-235446
Int. Cl. B62D *17/00*
U.S. Cl. 280—86.751 **4 Claims**



1. A suspension arm mounting structure, comprising:

a bolt and a nut cooperatively fastening a mounting end portion of a suspension arm relative to a bracket of a vehicle body side;

a pair of plate cams located at opposite ends of said bolt, said pair of plate cams being rotated so as to displace said bolt in a direction orthogonal to an axis thereof, whereby the wheel alignment is adjustable, said pair of plate cams and said bolt being rotatable relative to each other, so that the mounting end portion is fastened relative to said bracket by a head portion of said bolt; and

a cylindrical collar provided around a shank portion of said bolt, one end of said cylindrical collar provided with one of said pair of plate cams disposed on a side of said head portion of said bolt and a first engagement portion for engagement with a turning tool in such a manner as to prohibit a relative rotation therebetween, the other end of said cylindrical collar having a second engagement portion prohibiting a relative rotation between said cylindrical collar and the other of said pair of plate cams, whereby the adjustment of the wheel alignment and the fastening of said mounting end portion and said bracket can be performed only at the head portion side of said bolt.

US 6,409,190 B1

FRONT SUSPENSION DEVICE FOR A SKATE CART

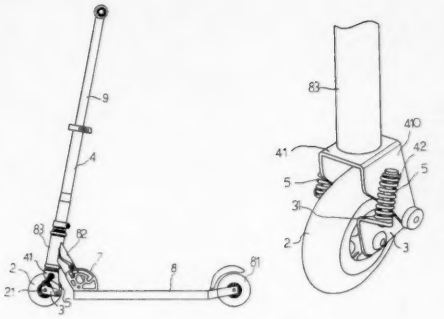
Shui-Te Tsai, No. 14, Lane 69, Tian Jin Road Section 4, Pei Tun Dist., Taichung City, Taiwan

Filed May 15, 2000, Appl. No. 583,108
Claims priority, application Taiwan, Feb. 21, 2000, 89202932 U
Int. Cl. B62M *1/00*
U.S. Cl. 280—87.041 **4 Claims**

1. A skate cart comprising:

a board having a rear wheel connected to a rear end of said board and a connection member extending from a front end of said board, a head tube connected to said connection member, a steerer tube rotatably extending through said head tube and a fork member located on a lower end of said head tube, a handlebar assembly securely connected to said steerer tube, two plates respectively pivotably connected to two sides of said fork member and a front wheel rotatably connected between said two plates,

said two plates each connected to one end of a spring and the other end of each of said springs connected to respective one of said two side of said fork member, and



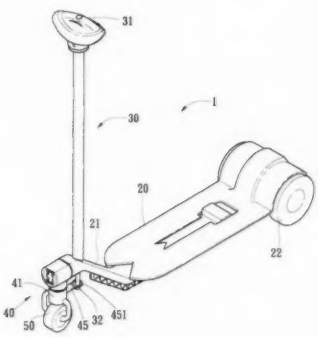
two frames connected on said board and said connection member pivotably connected between said two frames, a position member clamped adjacent to each of said fork member, said position members contacting said two frames when said connection member is pivoted toward said board.

US 6,409,191 B1

AUTOMATIC RESTORING DEVICE OF A SCOOTER'S WHEEL

Leao Wang, and Peter Wu, both of No 1, Lane 233, Sec. 2, Charng Long Rd., Taiping, Taiwan, 411

Filed Oct. 16, 2000, Appl. No. 688,284
Int. Cl. B62M *1/00*
U.S. Cl. 280—87.041 **1 Claim**



1. A scooter having an automatic restoring device for a steered wheel and comprising:

a) a footboard having front and rear ends with an extension part extending from the front end and a rear wheel assembly mounted at the rear end;

b) an elongated steering rod extending upwardly from the extension part, the steering rod including an extension post protruding downwardly from the extension part;

c) a front wheel steered by movement of the elongated steering rod; and,

d) an automatic restoring device attached between the extension part and the front wheel and including:

i) a shaft extending downwardly from the extension part, the shaft having a groove and an adjacent extension;

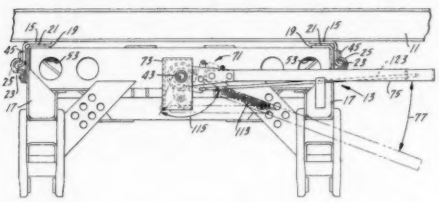
ii) a shaft sleeve concentrically enclosing the shaft, the front wheel being connected to the shaft sleeve;

iii) a shaft bushing mounted between the groove of the shaft and the shaft sleeve;

iv) a resilient element mounted between the extension of the shaft and the shaft sleeve; and,

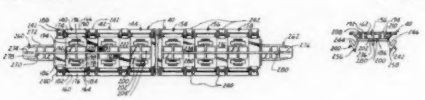
v) a lateral push rod extending from the shaft sleeve and having a loop thereon engaged by the extension post of the steering rod.

US 6,409,192 B1
SLIDER PIN RELEASE MECHANISM FOR A SEMI-TRAILER
Robert D. Botts, Mount Vernon, Mo., assignor to Tuthill Corporation, Burr Ridge, Ill.
Filed Aug. 9, 2000, Appl. No. 635,581
Int. Cl. B60G *5/06*
U.S. Cl. 280—149.2 **4 Claims**



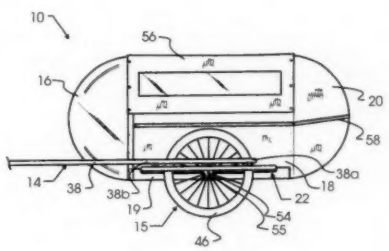
1. A slider pin release mechanism for a slider suspension system of a semi-trailer having a trailer body, said slider pin release mechanism including:
a slider suspension movable longitudinally forwardly and rearwardly relative to said trailer body,
a plurality of locking pins carried by said slider suspension and movable laterally into and out of locking engagement with said slider suspension and said trailer body,
a rod connecting each locking pin to a plate,
said plate attached to a longitudinally extending pivot rod carried on said slider suspension,
said longitudinally extending pivot rod including a forward end,
a ratchet gear affixed to said forward end of said pivot rod,
a handle mounted on said pivot rod for rotation relative to said ratchet gear,
a drive pawl mounted on said handle and engageable with said ratchet gear to drive said ratchet gear upon rotation of said handle,
a holding pawl engageable with said ratchet gear, and
a drive pawl release rod connected to said drive pawl.

US 6,409,193 B2
VEHICLE RUNNING BOARD CONSTRUCTION
Edward Helmut Bernard, Ontario, Canada, assignor to Bernard Mould, Ontario, Canada
Continuation of application No. 09/303,274, filed on Apr. 30, 1999, now Pat. No. 6,173,979. This application Jan. 12, 2001, Appl. No. 760,227.
This patent is subject to a terminal disclaimer.
Int. Cl. B60R *3/00*
U.S. Cl. 280—163 **19 Claims**



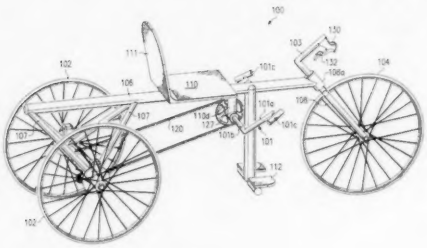
1. A vehicle running board step construction adapted for use with a hollow support step pipe in turn adapted to be secured to a vehicle exterior at first and second longitudinally opposite ends of the pipe, the pipe having an elongated step portion adapted in vehicle-mounted orientation to extend adjacent a sill of a vehicle door that provides access to a passenger or freight compartment of the vehicle, and wherein the pipe step portion has an elongate mounting opening formed in an upwardly facing exterior surface area thereof and defined by first and second laterally opposite and longitudinally extending opening side edges both lying in a plane chordally intersecting an upper radial cross sectional segment of the pipe,
said running board step construction comprising in combination:
a support plate adapted for straddling the pipe opening side edges and resting thereon for support,
said support plate further having first and second catch means adapted for respectively underlying the first and second pipe opening side edges and each having a distal end adapted for engaging an interior surface of the pipe for holding said support plate against upward release from the pipe,
and a step plate mounted on and covering said support plate and adapted to cover the mounting opening of the pipe, said step plate having a generally flat planar central step tread portion having an undersurface bearing upon said support plate, said step plate also having first and second downwardly extending side flanges adapted for respectively extending outwardly of and downwardly past the first and second pipe opening side edges and each terminating at a free end edge engaging the exterior surface of said pipe,
and fastening means securing said step plate onto said support plate.

US 6,409,194 B1
TRAILER AND METHOD OF USE
Stanley G. Voas, 401 Wilson Ave. SE., St. Cloud, Minn. 56304
Provisional application No. 60/170,707, filed on Dec. 14, 1999. This application Nov. 30, 2000, Appl. No. 727,265.
Int. Cl. B62D *47/00*
U.S. Cl. 280—204 **15 Claims**



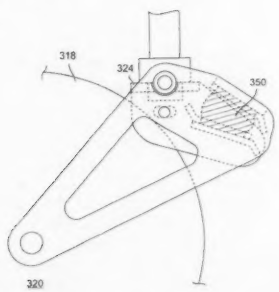
1. A trailer which is aerodynamically efficient when moved in a first forward direction defining a first axis for towing behind a land vehicle, comprising:
a carriage extending longitudinally parallel to said first axis within which cargo including persons may be transported, said carriage having a front, a back spaced from said front by a distance in a direction parallel to said first axis, and sides extending from said front to said back and forming a space the between for containment of said cargo;
a shield interposed between said carriage and said land vehicle to protect said cargo from hazards during transit, said shield having a convex shape with an apex and a base, said apex of said shield displaced from said base in a direction parallel to said first axis towards said land vehicle;
a tail member having a convex shape with a base adjacent said carriage and an apex displaced from said base in a direction parallel to said first axis away from said land vehicle;
a wheel set for contacting a surface upon which said trailer moves and maintaing said carriage, shield and tail member spaced from said surface;
a tongue for maintaining said trailer spaced a predictable distance from said land vehicle;
a first seat; and
a second seat displaced along said first axis from said first seat.

US 6,409,195 B1
HANDCRANKED REAR-WHEEL AXLE-DRIVEN SPORT WHEELCHAIR
Robert Joss Adams, 1907 Barton Hills Dr., Austin, Tex. 78704
Filed Mar. 14, 2001, Appl. No. 808,563
Int. Cl. B62M *1/14*
U.S. Cl. 280—250 **13 Claims**



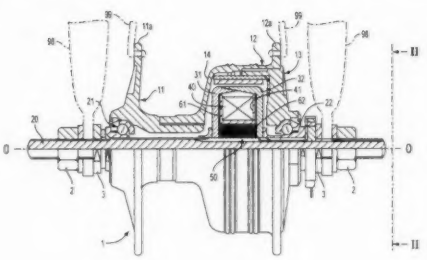
1. A sport wheelchair, comprising:
a frame tube;
a pair of rear wheels;
a single front wheel;
a rear axle that connects the rear wheels to each other;
a plurality of struts, at least one associated with each rear wheel, for connecting the rear axle to the frame tube;
a front fork that connects the front wheel to the frame tube, such that the front wheel may turn relative to the frame tube;
a seat attached to the frame tube between the front tire and the rear tires;
a handcrank assembly in front of the seat, having a handcrank axle rotatably connected to the frame tube and having a handcrank rigidly attached to each end of the handcrank axle;
a steering handle extending generally upwardly from the front fork, operable to change the direction of the front wheel; and
a gearing mechanism having a front sprocket operable to turn in response to rotation of the handcrank axle, at least one rear sprocket operable to turn the rear axle, and a chain connecting the front and rear sprockets.

US 6,409,196 B1
WHEELCHAIR FRONT FORK
Ryan J. McFarland, 38 Mount Rushmore Rd. #3, Custer, S. Dak. 57730
Filed Nov. 22, 1999, Appl. No. 444,397
Int. Cl. B60B *33/00*
U.S. Cl. 280—250.1 **6 Claims**



1. A suspension system for wheelchairs, the wheelchairs having a chassis and the chassis having a forward end, a rearward end, a top, and a bottom, comprising:
a receptor having an upper portion and a lower portion, the upper portion of the receptor being adapted to be attached to the forward bottom end of said chassis, said upper portion of the receptor being vertical and the lower portion of said receptor being bent into the general shape of a "U" with the "U" having a back which connects with said upper portion of said receptor and forward arms which are forward of said upper portion of said receptor, and the forward arms of the "U" of said lower portion of said receptor angled forwardly and downwardly from the vertical upper portion,
pivot means affixed to said receptor at a point between said upper portion of said receptor and said lower portion of said receptor, and
a bottom link having an upper portion and a lower portion, the bottom link being pivotally attached to said receptor by the pivot means such that said receptor and said bottom link may move in a scissors fashion, the upper portion of said bottom link being above said pivot means and the lower portion of said bottom link being below said pivot means, said upper portion of said bottom link being parallel, or nearly parallel, to the forward leg of the "U" of said lower portion of said receptor, and said lower portion of said bottom link being adapted to be affixed to an axle and wheel, and
spring means interposed between said upper portion of said bottom link and the forward arms of the "U" of said lower portion of said receptor such that the spring means tends to force said upper portion of said bottom link away from the forward arms of the "U" of said lower portion of said receptor.

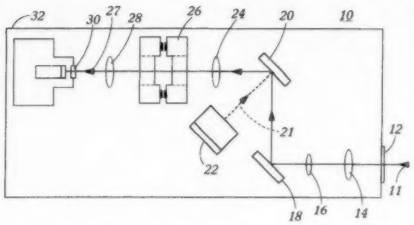
US 6,409,197 B1
CLAW-POLE DYNAMO AND BICYCLE
Takahiro Endo, Sakai, and Nagahiko Nagasaka, Nakama, both of Japan, assignors to Shimano, Inc., Osaka, Japan
Filed Aug. 11, 1999, Appl. No. 372,684
Claims priority, application Japan, Aug. 21, 1998, 10-235058
Int. Cl. B62J *6/12*
U.S. Cl. 280—288.4 **88 Claims**



45. A bicycle comprising:
a frame;
a front wheel rotatably mounted at a front of the frame;
a rear wheel rotatably mounted at a rear of the frame; and
a dynamo disposed on at least one of the front wheel and the rear wheel, wherein the dynamo comprises:
an annular member having a magnet extending in a circumferential direction thereof for rotation around an axis;
a first stator yoke having a first annular portion and a plurality of first pole shoes extending in a direction of the axis and facing the magnet;
a second stator yoke having a second annular portion and a plurality of second pole shoes extending in the direction of the axis and facing the magnet;
wherein the plurality of first pole shoes are interleaved with the plurality of second pole shoes in the circumferential direction;
a core yoke for magnetically coupling the first stator yoke and the second stator yoke and for transmitting a magnetic flux in the direction of the axis;
a coil disposed around the core yoke; and

a first separation member formed of metal disposed between the first stator yoke and the core yoke.

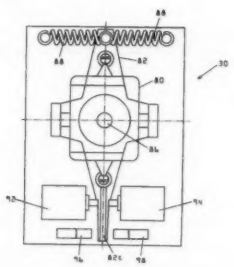
US 6,409,198 B1
METHOD AND APPARATUS FOR MEASURING ATMOSPHERIC TEMPERATURE
Carl Scott Weimer; Stuart Paul Beaton, both of Littleton; Martin Joseph O'Brien, Pine, and Loren Dean Nelson, Evergreen, all of Colo., assignors to Ophir Corporation, Littleton, Colo.
Filed Oct. 12, 1999, Appl. No. 416,565
Int. Cl. G01J *5/02*
U.S. Cl. 280—339.04 **38 Claims**



1. A device for passive, remote sensing of air temperature having a window for allowing radiation to pass from the atmosphere into the device and onto a detector which measures radiation intensity at selected wavelengths; and a temperature reference material that provides reference radiation from a known surface at a known temperature at said selected wavelengths comprising:

an actuated modulator for periodically alternating the radiation detected by the detector between the radiation from the atmosphere and that from the reference radiation emitted from the reference material such that the detector compares the radiation emitted from the atmosphere to that emitted by the reference material at said selected wavelengths in order to determine the air temperature.

US 6,409,199 B1
REAR WHEEL STEERING SYSTEM
Joseph James Boyd, 103 Timberlane Rd., Cumming, Ga. 30040
Filed Dec. 4, 2000, Appl. No. 729,570
Int. Cl. B62D *53/06*
U.S. Cl. 280—426 **3 Claims**



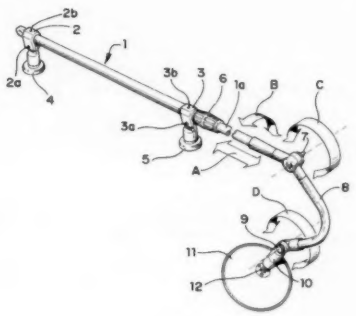
1. A method of rear wheel steering for a vehicle in a turn, the vehicle having rear wheels located on a pivotal rear wheel unit, the vehicle having a lengthwise centerline, the method of steering comprising the following steps:

(a) energizing a gyrocompass that will resist the turning force of the vehicle, the gyrocompass indicating the orientation of the rear wheel unit prior to the turn;

(b) detecting the orientation of the gyrocompass relative to the orientation of centerline of the vehicle through the vehicle turn; and

(c) turning the rear wheel unit in response to the difference in the orientations of the gyrocompass and the vehicle centerline when a preset difference in the orientations is reached.

US 6,409,200 B1
VISUAL ALIGNMENT AID FOR CONNECTING TRAILERS
James L. Glass, 103 Doral Cir., Naples, Fla. 34113, assignor to James L. Glass, Naples, Fla.
Filed Jan. 9, 2001, Appl. No. 756,517
Int. Cl. G02B *7/182*
U.S. Cl. 280—477 **6 Claims**



1. A visual alignment aid device for connecting a towing vehicle having a ball on a hitch to a trailer having a ball receiving socket on a tongue, said visual aid device consisting of an elongated tubular member having a sliding telescoping tubular member therein, said telescoping tubular member is a means for extending the length of said tubular member, said tubular member having means thereon for arresting said telescoping tubular member at a predetermined length and rotational position relative to said tubular member, said tubular member having means thereon for horizontally mounting said visual alignment aid device on a roof of a towing vehicle, an end of said telescoping member having a movable and curved arm attached thereto by way of an adjustable clamp hinge, an end of said curved arm having a movable short arm attached thereto by way of another adjustable clamp hinge, a convex mirror is attached to an end of said short arm, means for swiveling said convex mirror in a multiple of different directions.

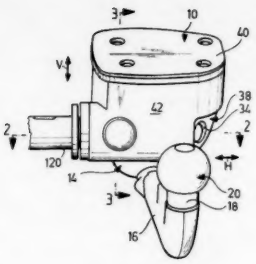
US 6,409,201 B1
TRAILER COUPLING
Hans Riehle, Ludwigsburg, Germany, assignor to ORIS Fahrzeugteile Hans Riehle GmbH, Moeglingen, Germany
Continuation of application No. PCT/EP99/07541, filed on Oct. 7, 1999. This application Jun. 21, 2000, Appl. No. 598,737.
Claims priority, application Germany, Oct. 21, 1998, 198 48 487
Int. Cl. B60D *1/54*
U.S. Cl. 280—491.1 **44 Claims**

1. A trailer coupling for motor vehicles, comprising:

a bearing part adapted to be fixed to a vehicle;

a pivotal part mounted on the bearing part and having a ball neck and a coupling ball, the pivotal part being pivotal, in relation to the bearing part, about an axis between a rest position and an operative position;

said pivotal part having first and second abutting elements spaced from one another; and



said bearing part being provided with first and second supporting elements;

wherein:

to fix the ball neck in said operative position against pivotal movement about said axis, the first supporting element and the first abutting element cooperate such that the ball neck undergoes a pivotal movement in a first direction which is countered by the second supporting element and the second abutting element, whereby the abutting elements and the supporting elements are able to abut against one another without play.

US 6,409,202 B1

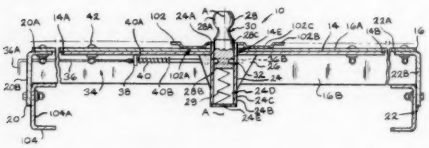
UNDERBED GOOSENECK

Rex D. Putnam, 239 Sherman St., Bronson, Mich. 49028

Filed Oct. 31, 2000, Appl. No. 703,067

Int. Cl. B60D *13/00*

U.S. Cl. 280—495 **27 Claims**



1. A trailer hitch assembly for a bed of a truck adjacent an opening in the bed of the truck, which comprises:

(a) a container having a first end and a closed, second end with a sidewall extending therebetween forming an inner chamber, the sidewall having an opening extending into the inner chamber wherein the container is mounted adjacent an underneath surface of the bed of the truck such that the first end of the container is adjacent the opening in the bed of the truck;

(b) a hitch ball mounted in the inner chamber of the container having a first ball end and a second end;

(c) a biasing means mounted in the inner chamber of the container between the closed, second end of the container and the second end of the hitch ball for biasing the hitch ball toward the open first end of the container; and

(d) a locking rod having a first end and a second end and mounted adjacent the container such that in a locked position, the first end of the locking rod extends through the opening in the sidewall of the container and into contact with the hitch ball and wherein the locking rod is capable of locking the hitch ball in an extended position or a retracted position.

US 6,409,203 B1

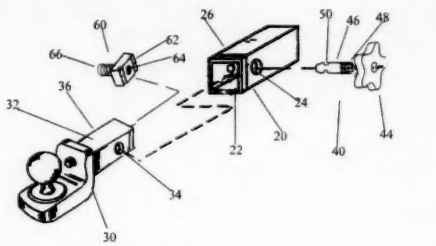
SECURING DEVICE FOR RECEIVER HITCHES

Marty Williams, Colorado Springs, Colo., assignor to Let's Go Aero, Inc, Colorado Springs, Colo.

Continuation-in-part of application No. 09/670,060, filed on Sep. 25, 2000. This application Nov. 3, 2000, Appl. No. 705,622.

Int. Cl. B60D *1/28*

U.S. Cl. 280—506 **3 Claims**



1. A method for securing a shank member to a receiver tube to minimize relative motion between the shank member and receiver tube, said method comprising the steps of:

providing an elongated pin;

providing a threaded portion on said elongated pin;

providing a nut having a threaded portion for engagement with said threaded portion of said elongated pin;

providing a slot in said shank for receiving said nut recessed within the outer surface of said shank member;

aligning said nut in said slot within the shank member with opposing side holes formed in the shank member;

inserting the shank member within the receiver tube until the opposing side holes of the shank member are aligned with opposing side holes of the receiver tube;

inserting said elongated pin through the opposing side holes formed in the receiver tube and through the opposing side holes formed in the shank member; and

engaging said threaded portion of said elongated pin with said threaded portion of said nut until the side wall of said shank member is firmly engaged by the inner side wall of said receiver tube.

US 6,409,204 B1

TELEMARK SKI BOOT AND RELEASABLE BINDING ASSEMBLY

Harold Edward Ayliffe, 1560 Richmond Street, North Vancouver, British Columbia, Canada, V7J 1B2, assignor to Harold Edward Ayliffe, North Vancouver, Canada

Continuation-in-part of application No. 09/014,331, filed on Jan. 27, 1998, now abandoned. This application May 19, 2000, Appl. No. 573,570.

Int. Cl. A63C *9/00*

U.S. Cl. 280—613 **14 Claims**

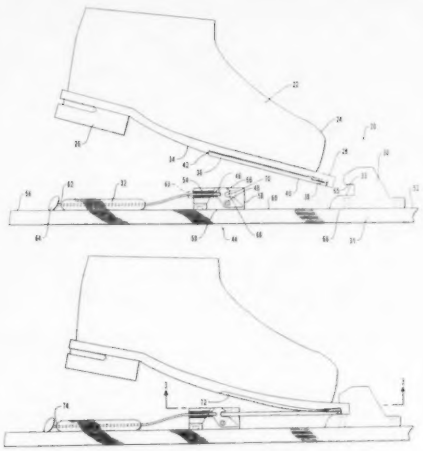
1. A boot and binding assembly for an elongate ski, the assembly comprising:

a boot having a sole, the sole being elongated and adapted to flex along its length and having a toe portion, a heel portion and an elongated interconnect member fixedly attached to said toe portion, said interconnect member extending rearwardly from said toe portion and having a rearmost portion located between the toe and heel portions of the boot;

a binding having a toe piece mountable to said ski for receiving the toe portion of the boot; and,

a latch assembly mountable to said ski behind the toe piece and under the sole of the boot for releasably holding said rearmost portion of said interconnect member;

wherein, when the toe portion is received in the toe piece and the rearward portion of the interconnect member is held by the latch assembly, the interconnect member is secured to the



ski in a position extending substantially parallel to an upper surface of the ski and the heel portion of the boot can be lifted away from the ski and at least a portion of said sole can be lifted away from at least said rearmost portion of said interconnect member by flexing said sole while the ski boot remains releasably mated to the ski by means of said interconnect member.

US 6,409,205 B1

INFANT CAR SEAT STROLLER

David M. Bapst, South Wales; Bryan Brown, and Julia Favorito, both of Buffalo, all of N.Y., assignors to Mattel, Inc., El Segundo, Calif.

Filed Oct. 21, 1999, Appl. No. 422,070

Int. Cl. B62B *7/06*

U.S. Cl. 280—642 **23 Claims**

1. A stroller latch for selectively configuring a stroller frame between a folded position and an unfolded position, the stroller frame including a stroller handle having a lower end and an upper end, front leg having an upper end and a rear leg hingedly coupled to the stroller handle through a rear leg hinge, said stroller latch comprising:

a latch mount adapted to be pivotally mounted to the lower end of the stroller handle and for fixedly mounting to the upper end of the front leg;

a collar adapted to be slidably coupled to the stroller handle, said collar including a locking sleeve adapted to be releasably engageable over the upper end of the front leg to lock the front leg and stroller handle in the unfolded position of the stroller frame; and

a latch handle pivotally coupled to the latch mount and for operatively releasing the locking sleeve from the upper end of the front leg and configuring the stroller frame in the folded position by pivoting said latch handle into mating engagement with said collar.

US 6,409,206 B1

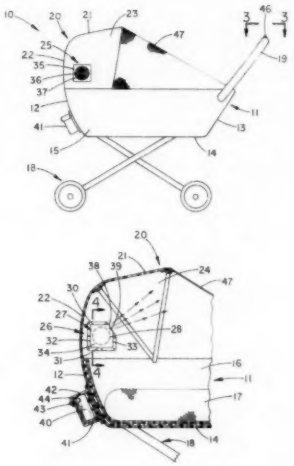
FAN COOLED BABY STROLLER

Ronald E. Willrich, 6563 Channing Dr., North Highland, Calif. 95660

Filed Sep. 16, 1999, Appl. No. 397,256

Int. Cl. B62B *1/00*

U.S. Cl. 280—658 **11 Claims**



1. A baby carriage, comprising:

a bassinet for resting an infant user therein and having an open top;

a canopy being mounted to said bassinet over said open top of said bassinet;

said canopy having a pair of side portions;

each of said side portions of said canopy having a fan assembly mounted thereto;

each fan assembly comprising a housing, and a blower fan and motor for rotating said blower fan disposed in said housing;

said housings of said fan assemblies being extended through the associated side portion of said canopy;

said housings of said fan assemblies each having a back face, and inner and outer side faces;

said inner side face of each housing facing inwards into said canopy from the associated side portion of said canopy;

said outer side face of each housing facing outwards from said canopy from the associated side portion of said canopy;

said outer side face of each housing having an inlet opening therein;

said back face of each of said housings having an outlet opening therethrough; and

wherein said outlet openings each have a portion extending into said inner side face of the respective housing, said outlet openings each directing air flow generated by said blower fan along an interior face of an associated one of said side portions of said canopy for directing the air flow in a path away from a face of an infant in said bassinet.

US 6,409,207 B1

SWIVEL DRAW BAR STRUCTURE OF A SUITCASE

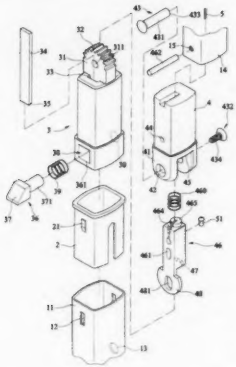
Chung-Hsien Kuo, Taipei Hsien, Taiwan, assignor to Chaw Khong Technology Co., Ltd., Taipei Hsien, Taiwan

Filed Oct. 12, 2000, Appl. No. 686,857

Claims priority, application Taiwan, Jul. 17, 2000, 089212335

Int. Cl. B62B *1/00;* **A45C** *13/00;* **A47B** *95/02*

U.S. Cl. 280—665.1 **9 Claims**



9. A swivel draw bar structure of a suitcase, said draw bar comprising an upper joint tube and a lower joint tube, a handle being joined with said upper joint tube, a drive element being connected to said handle, a swivel sleeve seat being installed at the bottom end of said upper joint tube, a fixing sleeve being installed at the top end of said lower joint tube, said swivel sleeve seat being pivotally joined with said fixing sleeve via a spindle, an upward longitudinal groove being disposed on the bottom surface of said swivel sleeve seat, said swivel draw bar structure further comprising:

a slide retaining element inserted in said longitudinal groove of said swivel sleeve seat, said slide retaining element having a long hole, said long hole being joined with a pin hole of said swivel sleeve seat and a hole of said upper joint tube via a pin, said slide retaining element being joined with said drive element, a retaining sheet extending downwards from said slide retaining element, an elliptic hole penetrated through by said spindle being formed on said retaining sheet, a straight groove and a transversal groove being disposed in said fixing sleeve;

a slide sheet inserted in said straight groove of said fixing sleeve, the top end of said slide sheet contacting with said retaining sheet of said slide retaining element; and

a retractable button installed in said transversal groove of said fixing sleeve and contacting with the bottom end of said slide sheet;

whereby when said retractable button is driven to slide in said fixing sleeve, a projective part of said retractable button can move out from a hole of said fixing sleeve to be locked and positioned in a hole of said lower joint tube, and when said upper joint tube is turned, a locking state can be released so that said fixing sleeve can move in said lower joint tube.

US 6,409,208 B1

DETENT CONNECTION

Ralph Frisch, Mömbris, and John-Oliver Derrick, Hettstadt, both of Germany, assignors to TRW Automotive Safety Systems GmbH & Co. KG, Aschaffenburg, Germany

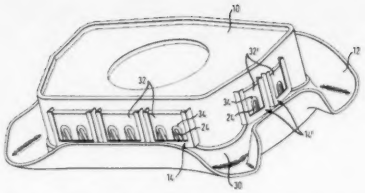
Filed Sep. 29, 2000, Appl. No. 675,605

Claims priority, application Germany, Nov. 15, 1999, 299 20 024

Int. Cl. B60R *21/16*

U.S. Cl. 280—728.2 **8 Claims**

1. A detent connection for a gas bag cover of a vehicle occupant restraint system, said detent connection comprising:



at least two retaining parts, one of said retaining parts including at least one detent nose and the other of said retaining parts having an opening to receive said detent nose to connect said two retaining parts;

said detent nose being designed such that upon shifting of said two retaining parts relative to each other said other of said retaining parts is arched by a force applied to said other of said retaining parts by said detent nose acting substantially perpendicular to a shifting direction before said detent nose latches in said opening,

said other of said retaining parts comprising a tab having said opening and said one of said retaining parts comprising a guide element by means of which said tab is guided,

said guide element comprising a cross portion and two parallel spaced apart guide surfaces for engaging opposite sides of said tab,

said detent nose being located between said two guide surfaces.

US 6,409,209 B2

AIRBAG APPARATUS

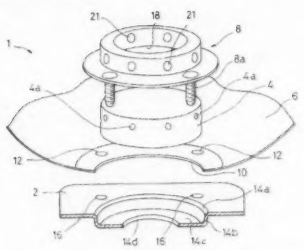
Ichiro Amamori, and Tadahiro Igawa, both of Tokyo, Japan, assignors to Takata Corporation, Tokyo, Japan

Filed Apr. 17, 2001, Appl. No. 835,850

Claims priority, application Japan, Apr. 21, 2000, 2000-121333

Int. Cl. B60R *21/16*

U.S. Cl. 280—728.2 **9 Claims**



1. An airbag apparatus comprising:

a base member including an inflator-reception area having an opening, a peripheral wall extending rearwardly around the opening and an inward flange disposed in a rear end of the peripheral wall to extend inwardly therefrom and form a center opening,

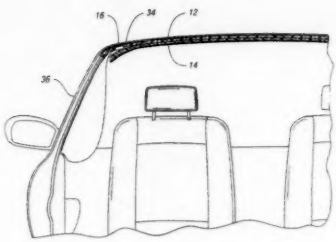
an airbag situated above the base member,

an airbag-fitting member disposed on the base member to attach the airbag between the airbag-fitting member and the base member and including a capping portion having an opening, a peripheral wall extending forwardly around the opening and an inward flange disposed in a front end of the peripheral wall to extend inwardly therefrom and form a center opening,

an inflator for generating gas to inflate the airbag, said inflator having a smooth side face without a projection projecting outwardly from the side face of the inflator and being disposed in the openings of the inflator-reception area and the capping portion, said inflator being held between the inward flanges of the inflator-reception area and the capping portion and fixed to the base member by the airbag-fitting member, and

a module cover for covering the airbag in a folded condition.

US 6,409,210 B1
INTEGRATED SIDE AIR CURTAIN AND INFLATOR OVERHEAD SYSTEM
David Emerling, West Bloomfield, Mich., assignor to Lear Corporation, Southfield, Mich.
Filed Jul. 14, 2000, Appl. No. 616,850
Int. Cl. B60R *21/22*
U.S. Cl. 280—730.2 **10 Claims**



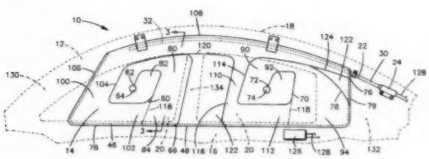
9. A method of manufacturing an integrated vehicle headliner and air curtain assembly comprising:

providing a plurality of separately overlaid headliner layers arranged with terraced edges proximate a side portion of the interior of the vehicle;

positioning an inflatable air curtain between said plurality of layers; and

compression molding the plurality of layers to form a headliner assembly with the air curtain tightly compressed between said layers proximate the terraced edges to minimize packaging requirements.

US 6,409,211 B1
INFLATABLE SIDE CURTAIN
Jianping Sheng, Rochester Hills, and Chaoz Hou Chen, Troy, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio
Filed Oct. 10, 2000, Appl. No. 685,395
Int. Cl. B60R *21/22;21/06*
U.S. Cl. 280—730.2 **16 Claims**



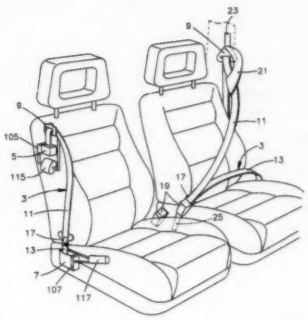
1. Apparatus for helping to protect an occupant of a vehicle that has a side structure and a roof, said apparatus comprising:

a vehicle occupant protection device that is inflatable away from the vehicle roof into a position between the side structure of the vehicle and a vehicle occupant; and

an inflation fluid source that provides inflation fluid for inflating said vehicle occupant protection device;

said vehicle occupant protection device comprising a seam extending in a spiral-like manner from a location within the outer periphery of the vehicle occupant protection device to define at least one spiral-shaped chamber portion of the vehicle occupant protection device.

US 6,409,212 B1
BELT SYSTEM FOR RESTRAINING A VEHICLE OCCUPANT
Franz Wier, Göggingen, Germany, assignor to TRW Occupant Restraint Systems GmbH & Co. KG, Aldorf, Germany
Filed Nov. 24, 1999, Appl. No. 448,967
Claims priority, application Germany, Nov. 27, 1998, 298 21 272 U
Int. Cl. B60R *21/18;22/46*
U.S. Cl. 280—733 **13 Claims**



9. A belt system for restraining a vehicle occupant, said belt system comprising:

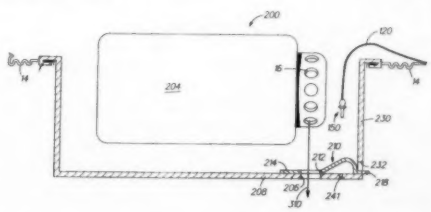
an inflatable safety belt having an inflatable shoulder belt portion in fluid connection with an inflatable pelvic belt portion and having an inflated condition and a deflated condition, said safety belt having opposite ends; and

a safety belt end fitting tensioner located at each of said opposite ends of said safety belt,

each of said end fitting tensioners including a safety belt retractor and a gas generator in flow connection with both of said safety belt and said end fitting tensioner,

each of said gas generators, upon inflation of said inflatable safety belt, providing inflation gas to said safety belt to inflate said shoulder belt portion and said pelvic belt portion and providing gas to each of said end fitting tensioners to tension said safety belt.

US 6,409,213 B2
ADAPTIVE INFLATION MECHANISM
James Lloyd Webber, Shelby Township, Macomb County, Mich., and Robert Lee Jones, Centerville, Ohio, assignors to Delphi Technologies, Inc., Troy, Mich.
Division of application No. 09/473,436, filed on Dec. 28, 1999. This application May 25, 2001, Appl. No. 866,366.
Int. Cl. B60R *21/30*
U.S. Cl. 280—739 **13 Claims**



1. An air bag module for restraint of an occupant in vehicle, the air bag module comprising:

an air bag cushion having a rear surface;

an inflator being activatable to discharge inflator gas for inflating the air bag cushion, the inflator having at least one discharge vent port through which the inflator gas is discharged;

a module housing having at least one first vent opening formed therein, the inflator being disposed within the module housing and the air bag cushion being retained to the module housing, the module housing having a slot formed therein;

a slide mechanism having a slide member disposed within the module housing proximate the at least one first vent opening, the slide mechanism having a slide vent opening;

at least one tether having a first end and an opposing second end; and

a retaining member being attached to the first end of the at least one tether, the retaining member for releasably retaining the slide member in a closed position where the slide vent opening and the at least one first vent opening are not in fluid communication, the second end being attached to the rear surface of the air bag cushion, wherein during inflation of the air bag cushion, the inflator gas flows according to a first fluid flow path into the air bag cushion until the air bag cushion reaches a predetermined pressure at which time the at least one tether is tightened causing the retaining member to be disengaged from the slide mechanism permitting movement of the slide member so that the at least one first vent opening and the slide vent opening fluidly communicate with each other permitting the inflator gas to be expelled out of the air bag module housing away from the air bag cushion.

US 6,409,214 B2

AIRBAG INFLATOR AND AN AIRBAG APPARATUS

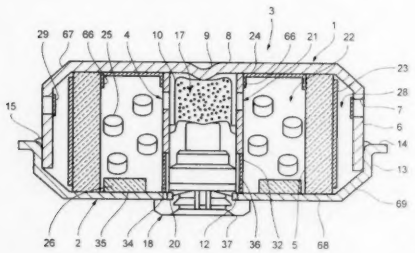
Nobuyuki Katsuda; Shingo Oda, both of Hyogo, and Masayuki Ueda, Kanagawa, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Division of application No. 08/829,314, filed on Mar. 31, 1997. This application Dec. 31, 1998, Appl. No. 224,805.

Claims priority, application Japan, Apr. 8, 1996, 8-85389; Apr. 8, 1996, 8-85390; Jul. 31, 1996, 8-202460; Jul. 31, 1996, 8-202461; Jul. 31, 1996, 8-202462; Jul. 31, 1996, 8-202463; Jul. 31, 1996, 8-202464; Aug. 29, 1996, 8-228620; Oct. 31, 1996, 8-290348; Oct. 31, 1996, 8-290349

Int. Cl. B60R *21/26*

U.S. Cl. 280—741 **47 Claims**



1. An airbag inflator, comprising:

a housing having a diffuser shell and a closure shell, the diffuser shell being formed by pressing a metal plate and including a circular portion, and a circumferential wall portion formed at an outer circumference of the circular portion and having gas discharge ports, the closure shell being formed by pressing a metal plate, and including a circular portion having a bent portion defining a center hole formed at a center of the circular portion, the bent portion extending towards an outer side with respect to said closure shell along a longitudinal axis of said housing, and forming an inner circumferential surface; and

a central cylinder member provided within said housing, said central cylinder member having first through-holes defined therein, and being inserted through the center hole,

wherein an entire inner circumferential surface of the bent portion forms a receiving portion that receives an outer circumferential surface of said central cylinder member, and the receiving portion has only a single inner diameter.

US 6,409,215 B1

OPERATING DEVICE FOR ANTI-SKID DEVICES FOR VEHICLES

Lars Holmgren, Vanesbord, Sweden, assignor to VBG Produkter AB, Vänersborg, Sweden

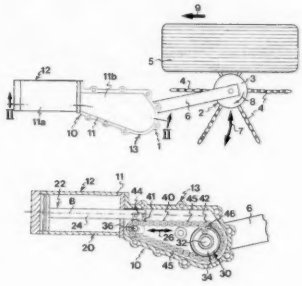
PCT No. PCT/SE99/00107, § 371 Date Aug. 24, 2000, § 102(e) Date Aug. 24, 2000, PCT Pub. No. WO99/38714, PCT Pub. Date Aug. 5, 1999

PCT Filed Jan. 27, 1999, Appl. No. 600,956

Claims priority, application Sweden, Jan. 29, 1998, 9800243

Int. Cl. B60B *39/00*

U.S. Cl. 280—757 **12 Claims**



1. An operating device for anti-skid devices for vehicles, comprising:

an operating unit, and

an operating arm for supporting at an end spaced from the operating unit a rotary anti-skid means, said operating arm being pivotally mounted on the operating unit for movement between an active position and a rest position,

said operating unit including:

a linear drive acting along a longitudinal axis,

a rotary rotatable about a rotational axis,

a deflector, and

a drive transmission element extending in a continuous loop around the rotary and the deflector, and extending essentially along the longitudinal axis of the drive between the drive and the rotary,

said drive transmission element being arranged to translate linear movement of the drive in two opposite directions into rotational movement of the rotary, said rotational movement producing a pivotal movement of said operating arm between the active position and the rest position.

US 6,409,216 B2

SUSPENSION FRAME CONSTRUCTION

Tomoyuki Suzuki, Hamamatsu, Japan, assignor to Suzuki Motor Corporation, Shizuoka-ken, Japan

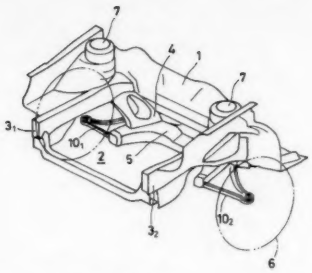
Filed Mar. 8, 2001, Appl. No. 801,995

Claims priority, application Japan, Mar. 17, 2000, 2000-075088; Apr. 12, 2000, 2000-110141

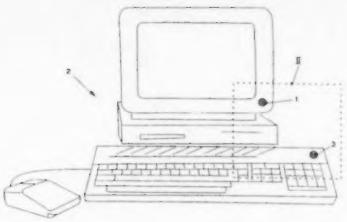
Int. Cl. B62D *21/00*

U.S. Cl. 280—781 **13 Claims**

1. A suspension frame construction comprising an upper plate and a lower plate joined to each other to form a suspension frame; and front- and rear-side suspension arm support portions provided at both ends, right and left, of said suspension frame, wherein said lower plate comprises a pair of side plates each provided with a support portion for supporting at least a rear-side arm of a suspen-



sion arm and a center plate for connecting said slide plates to each other.

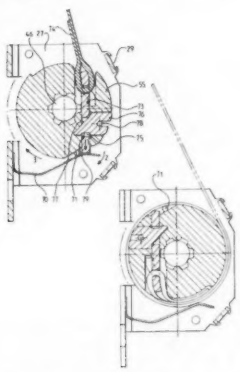


invisible and only detectable with a special device, the film having an edge contour adjacent and corresponding to an edge contour of a label applied to the object, with essentially no marking material beneath the label, to provide an invisible outline of the label on the object.

US 6,409,217 B1
SAFETY-BELT ARRANGEMENT

Arnaud Denis, Lainville-en-Vexin, France, assignor to Autoliv Development AB, Vargarda, Sweden

Filed Sep. 27, 2000, Appl. No. 670,875
Claims priority, application United Kingdom, Sep. 27, 1999, 9922836
Int. Cl. B60R *22/36;* **A47C** *31/00*
U.S. Cl. 280—806 **33 Claims**



1. A safety-belt arrangement for use in a motor vehicle, the arrangement comprising a safety-belt, the safety-belt carrying a tongue to co-operate with a buckle, the safety-belt carrying an end fixing, the arrangement further incorporating an anchoring unit incorporating rotatable spool, the spool being provided with a first catch to engage and retain said end fixing fast with the spool in response to a predetermined movement of the end fixing relative to the spool, means being provided to rotate the spool.

US 6,409,218 B1
THEFT PROTECTION MARKING AND MARKING METHOD

Hermann Wemmel, Gifhorn, and Gustav Wagenmann, Wolfsburg, both of Germany, assignors to Volkswagen AG, Germany

Continuation of application No. PCT/EP98/07848, filed on Dec. 3, 1998. This application Jun. 2, 2000, Appl. No. 586,112.
Claims priority, application Germany, Dec. 9, 1997, 197 54 404
Int. Cl. B42D *15/00*
U.S. Cl. 283—81 **8 Claims**

1. A theft protection marking for an object comprising a film of a marking material applied over a label on an object, the film being

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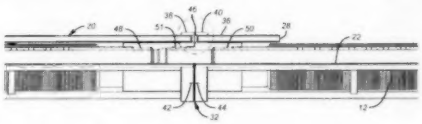
US 6,409,219 B1
DOWNHOLE SCREEN WITH TUBULAR BYPASS

Todd Broome, The Woodlands; Benn Voll; Perry Douglas Baycroft, both of Houston, all of Tex.; Elmer Richard Peterson, Lafayette, La., and Bobby Edward Hall, Houston, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Nov. 12, 1999, Appl. No. 439,797
Int. Cl. F16L *39/00*
U.S. Cl. 285—3 **21 Claims**



1. A tubular connection apparatus comprising:

at least a first tubular having a first bore and a first connection at at least one end and at least a first transport tube segment having an inner and outer wall, out of fluid communication with said first bore, and having a first longitudinal axis, and extending from adjacent said first connection;

at least a second tubular having a second bore and a second connection at at least one end and at least a second transport tube segment having an inner and outer wall, out of fluid communication with said second bore, and having a second longitudinal axis, and extending from adjacent said second connection;

said first and second connections joinable by relative rotation of said first and second tubulars, whereupon said longitudinal axes of said transport tube segments are rotated into sealing alignment when a predetermined torque is applied to secure said first connection to said second connection.

US 6,409,220 B1
UNIVERSAL SUCTION CANISTER POUR SPOUT ADAPTOR

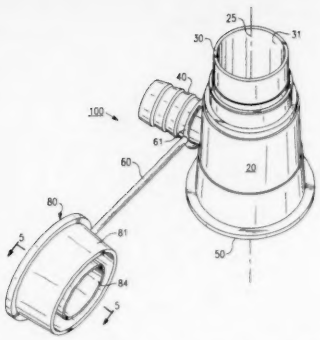
Daniel M. Wing, Utica; John Sutherland, New Hartford, and Stephen J. Scheuermann, Oneida, all of N.Y., assignors to ConMed Corporation, Utica, N.Y.

Filed Sep. 19, 2000, Appl. No. 665,028
Int. Cl. F16L *55/00;* **A61M** *25/00;* **B01D** *63/00*
U.S. Cl. 285—12 **10 Claims**

1. A universal adaptor for engaging the pour spout of a suction canister to enable materials to be drawn into the canister through the pour spout, comprising:

a housing for receiving materials to be drawn into a suction canister for disposal;

said housing having a first end and a second end coaxial about a longitudinal axis and defining an opening in said housing



between said first end and said second end through said housing extending along said longitudinal axis;

said first end of said housing having a plurality of external diameters stepped in increasing diameters inwardly from said first end opening;

said second end of said housing having a plurality of internal diameters stepped in decreasing diameters inwardly from said second end opening;

an input port carried by said housing between said first end and said second end for coupling to a source of material to be drawn into said housing; and

a closure adapted to mutually exclusively close one of said first end or said second end so that materials drawn through said input port can be drawn through said housing and discharged into a suction canister to which the adaptor is engaged.

US 6,409,221 B1

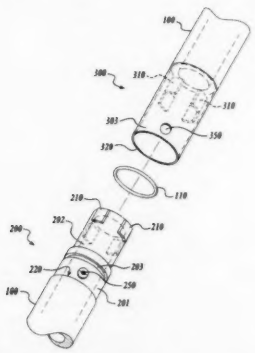
QUICK LOCKING PIPE JOINT FOR ROUND, PLAIN, OR PROFILED PIPE

Michael I. Robinson, Mountlake Terrace, and Thomas G. Bumala, Lake Forest Park, both of Wash., assignors to Phoenix Geometrix, LLC, Mountlake Terrace, Wash.

Provisional application No. 60/139,910, filed on Jun. 17, 1999. This application Jun. 12, 2000, Appl. No. 591,924.

Int. Cl. F16L *55/00*

U.S. Cl. 285—91 **16 Claims**



1. A joint for connecting a first pipe to a second pipe, said joint comprising a male joint member and a female joint member, wherein:

said male joint member comprising cylindrical first and second tubes, said first tube having a first outer diameter, a first length, a proximal end coaxially attached to said first pipe and a distal end, said second tube having a second outer diameter less than said first outer diameter, a second length, a proximal end coaxially attached to said first tube distal end, and a distal end, said second tube further comprising a plurality of circumferentially spaced first locking tabs having an axial length and extending outwardly from said second tube adjacent said distal end, said first locking tabs having an outer diameter approximately equal to said first outer diameter;

said female joint member comprising a cylindrical third tube having a proximal end coaxially attached to said second pipe and a distal end, said third tube having an inner diameter approximately equal to said first outer diameter and a length approximately equal to said first length plus said second length, said third tube further comprising a plurality of second locking tabs extending inwardly from said third tube and spaced circumferentially generally the same as said first locking tabs and located axially a distance from said third tube proximal end approximately equal to said first locking tabs' axial length, said second locking tabs having an inner diameter approximately equal to said second outside diameter;

whereby said male joint member can be slidably inserted into said female joint member such that said first locking tabs slide past said second locking tabs whereupon said male joint member may be rotated relative to said female joint member to locate said first locking tabs behind said second locking tabs.

US 6,409,222 B1

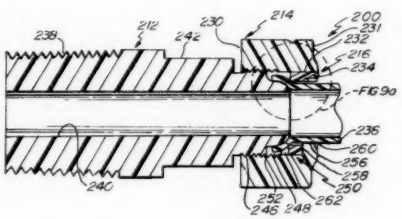
TORQUE CONFIRMATION FITTING

James Donoho, Golden Valley; Michael Stoick, Prior Lake, and Eric Soderstrom, Lauderdale, all of Minn., assignors to Fluroware, Inc., Chaska, Minn.

Filed Jun. 8, 2000, Appl. No. 590,544

Int. Cl. F16L *35/00;55/00*

U.S. Cl. 285—93 **20 Claims**



1. A combination plastic torque confirmation fitting and a section of plastic tubing with a flared end for coupling to the fitting, said fitting comprising:

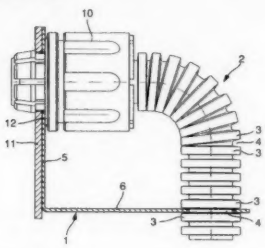
a fitting body having a nose section, wherein said nose section supports said section tubing;

a torque confirmation portion; and

a fitting nut operably joinable to said fitting body and engageable with said torque confirmation portion,

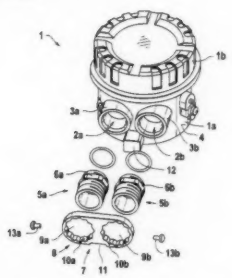
wherein upon joining of said fitting nut to said fitting body with the torque confirmation portion and the flared end of the section of tubing therein, said fitting nut engages said torque confirmation portion and the continued joining of said fitting nut to said fitting body causes said torque confirmation portion to provide a visual indication when said fitting nut has been sufficiently tightly joined to said fitting body.

US 6,409,223 B1
CORRUGATED HOSE WITH A HOLDER
Mario Bartholomä, Winden, Germany, assignor to Anton Hummel Verwaltungs GmbH, Waldkirch, Germany
Filed May 26, 2000, Appl. No. 579,052
Claims priority, application Germany, Jun. 4, 1999, 299 09 715 U
Int. Cl. F16L *27/10;55/00*
U.S. Cl. 285—114 **12 Claims**



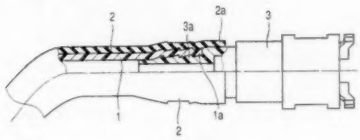
1. A corrugated hose with a holder to fix the corrugated hose (**2**) in a position that is angled in relation to a lengthwise projection thereof, whereby the holder (**1**) fits snugly into at least one recess (**4**) of the corrugated hose between axially adjacent corrugations (**3**) of the corrugated hose (**2**), comprising the holder (**1**) having at least two legs (**5**, **6**) that tightly fit the corrugated hose (**2**) which curves between the two legs (**5**, **6**) in a position for use, at least one of the legs (**6**) has at least one cut-out (**8**) that includes a side opening for inserting the recess (**4**) of the corrugated hose (**2**), whereby the side opening (**9**) of the cut-out (**8**) is smaller than an outer diameter of the corrugated hose in a corrugation valley (**4**), and a thickness of the holder (**1**) in an area of the cut-out (**8**) is the same or less than an axial dimension of the corrugation valley.

US 6,409,224 B1
FASTENING MEANS
Robert Schmidt, Steinen, and Berthold Laurinat, Lörrach, both of Germany, assignors to Endress + Hauser GmbH + Co., Maulburg, Germany
Provisional application No. 60/145,301, filed on Jul. 23, 1999. This application May 31, 2000, Appl. No. 584,322.
Claims priority, application European Pat. Off., Jul. 23, 1999, 99114526
Int. Cl. F16L *39/00*
U.S. Cl. 285—124.3 **55 Claims**



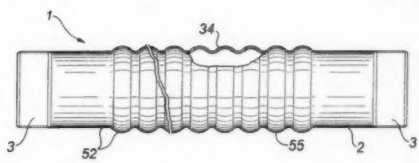
1. A fastener for a housing having an interior for accommodating an item of equipment, at least two bushings which permit access into the housing interior for lines, such as for example signal lines, supply lines or conduits or the like, and adapters for connecting the lines to the bushings; the fastener comprising a base plate with at least two openings which correspond in shape and arrangement to the adapters and the inner surfaces of which are shaped in such a way that the base plate fits positively onto the adapters and the latter are positively braced with respect to one another.

US 6,409,225 B1
HOSE-CONNECTOR ASSEMBLY INCLUDING OUTER RUBBER PROTECTOR TUBE WHICH COVERS ENTIRE LENGTH OF INNER RESIN TUBE, AND METHOD OF PRODUCING THE SAME
Takashi Ito, Komaki, Japan, assignor to Tokai Rubber Industries, Ltd., Komaki, Japan
Filed Dec. 30, 1999, Appl. No. 476,248
Claims priority, application Japan, Mar. 31, 1998, 10-85325
Int. Cl. F16L *35/00;11/04*
U.S. Cl. 285—222.1 **21 Claims**



1. A hose-connector assembly comprising:
an inner resin tube having an outer circumferential surface and opposite end portions;
an outer rubber protector tube having an inner circumferential surface that is held in close contact with said outer circumferential surface of said inner resin tube over an entire length of said inner resin tube; and
a tubular connector having opposite end portions one of which is press-fitted in each of at least one of said opposite end portions of said inner resin tube,
wherein said tubular connector has a retainer portion and a hose joint portion disposed on one of opposite sides of said retainer portion, and said outer rubber protector tube has an end portion which corresponds to said one of said opposite end portions of said tubular connector and which extends beyond an end face of the corresponding end portion of said inner resin tube in a direction toward said retainer portion of said tubular connector, said one end portion of said outer rubber protector tube being held in contact with an outer circumferential surface of said hose joint portion of said tubular connector.

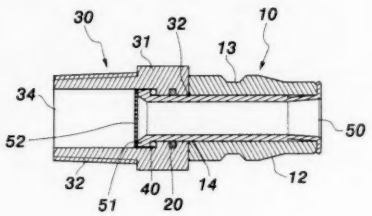
US 6,409,226 B1
"CORRUGATED THICK-WALLED PIPE FOR USE IN WELLBORES"
Maurice William Slack; Trent Michael Victor Kaiser, and Gerald Adrien Joseph Beaulac, all of Edmonton, Canada, assignors to Noetic Engineering Inc., Edmonton, Canada
Provisional application No. 60/132,632, filed on May 5, 1999. This application May 4, 2000, Appl. No. 566,345.
Int. Cl. F16L *21/00;27/12*
U.S. Cl. 285—226 **17 Claims**



1. A string of joints of metal thick-walled pipe extending through and being restrained by earth material, the string being subject to change in axial load subsequent to installation, the string comprising:
at least one such joint having a side wall which has been formed along at least part of its length into sinusoidal corrugations;
the corrugated joint having a diameter to wall thickness ratio (D/t) less than 100;
the corrugations having a corrugation radius of curvature to thickness ratio (R/t) less than 10; and

the corrugations varying in wall thickness along their length, as a result of having been formed.

US 6,409,227 B1
FAST ROTATION JOINT
Wen Hua Lu, and Tzu-Chuan Tien, both of No. 7-8, Niu Pu Tsu, Tan Shui Jen, Taipei Hsien, Taiwan
Filed Dec. 21, 2000, Appl. No. 741,186
Int. Cl. F16L *27/00*
U.S. Cl. 285—276 **9 Claims**



1. A fast rotation joint comprising:

a first main body having a hollow inner portion and front and rear openings communicating therewith; an inclined surface extending thereon; a groove being formed at a rear end of the inclined surface;

a second main body having a hollow inner portion, and front and rear openings communicating therewith; an outer edge thereof being formed with a hexagonal head; a threaded portion extending from the hexagonal head;

a drain-preventing pad being connected between the rear opening of the first main body and the front opening of the second main body;

a third main body passing through the first main body, second main body, and the drain-preventing pad; the third main body having a flange extended from a rear end thereof disposed within the second main body, the third main body having formed at a front end thereof a radially flared portion for axially retaining the first main body; and

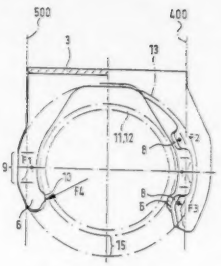
a plurality of rollers disposed between the second main body and the third main body.

US 6,409,228 B1
SPRING SYSTEM FOR CONNECTING TWO FLANGES
Rolf Fadini, Leutenbach; Helmut Hutt, and August Kästner, both of Welzheim, all of Germany, assignors to Christian Bauer GmbH & Co. KG, Welzheim, and DaimlerChrysler AG, Stuttgart, both of Germany
PCT No. PCT/DE98/01927, § 371 Date Jan. 4, 2000, § 102(e) Date Jan. 4, 2000, PCT Pub. No. WO99/02912, PCT Pub. Date Jan. 21, 1999
PCT Filed Jul. 4, 1998, Appl. No. 462,212
Claims priority, application Germany, Jul. 7, 1997, 197 28 973
Int. Cl. F16L *37/00*
U.S. Cl. 285—305 **4 Claims**

1. Spring device in combination with two flanges for connecting the two flanges to ends of pipes to be connected to one another, in particular of two pipes of a motor-vehicle exhaust system, having the following features:

the spring device is as an elastically flexible clamp having U-shaped, functionally first and second clamping jaws (**1**, **2**) and (**4**, **5**), respectively, situated opposite each other,

U-limbs (**6**, **7**) of the functionally first clamping jaws (**1** and **2**, respectively) lie in two essentially parallel clamping planes (**100**, **200**) of the clamping jaw (**1** and **2**, respectively),



said U-limbs (**6**, **7**) of the functionally second clamping jaws (**4** and **5**, respectively) lie in two essentially parallel clamping planes (**400**, **500**) of the second clamping jaws (**4** and **5**, respectively),

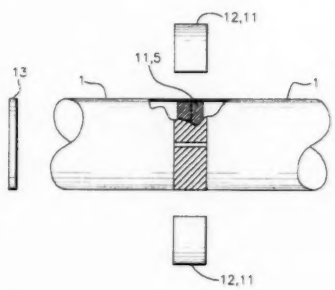
the spring device is in one piece with a spring back region (**3**) and consists exclusively of the elastically flexible clamp,

the first and second clamping jaws (**1**, **2** and **4**, **5**, respectively) have respective pivot axes (**S1** and **S2**, respectively) which intersect each other in the spring back region (**3**) at right angles in a common plane,

by being pivoted about the pivot axis **S1** of the functionally first clamping jaws (**1**, **2**) and also at least by being pivoted about the pivot axis **S2** of one of the functionally second clamping jaws (**4**, **5**), the clamp is fixed on the mutually remote end surfaces of the flanges (**13**, **14**) with a clamping force that includes an axial force desired for the flange connection,

said U-limbs (**6**, **7**) of the clamping jaws (**1**, **2**; **4**, **5**) for the first and second function of these clamping jaws (**1**, **2**; **4**, **5**) have, in the respective clamping planes (**100**, **200**, **400** and **500**), regions (**8**, **9**, **10**), which are only locally tightly restricted, for a direct bearing against the parts (**11**, **13**; **12**, **14**) which are to be connected to one another by the clamp, there being in at least one of the clamping planes (**100** or **200**) four bearing regions (**8**) which exert two clamping functions and of which in each case two are arranged in pairs diametrically opposite each other.

US 6,409,229 B1
PLASTIC PIPE AND DUCT JOINT CONNECTIONS
Lawrence E. Shea, 2809 Mountains Springs Rd., Reno, Nev. 89509
Filed Nov. 13, 2000, Appl. No. 711,719
Int. Cl. F16L *13/10*
U.S. Cl. 285—371 **14 Claims**



1. A joint assembly for joining together end to end plastic pipe or duct sections having interior and exterior walls, comprising

an internal tubular resin slip collar having exterior walls with an outside diameter less than the diameter of said pipe and duct sections interior walls,

an external tubular resin slip collar having interior walk with an inside diameter greater than the diameter of said pipe and duct sections exterior walls,

whereby the internal slip collar is mounted with the joined pipe or duct sections interior walls,

whereby the external slip collar is mounted around the joined pipe or duct sections,

whereby the internal slip collar and joined pipe and duct sections are adhesively bonded together and the external slip collar and the pipe or duct sections are adhesively bonded together,

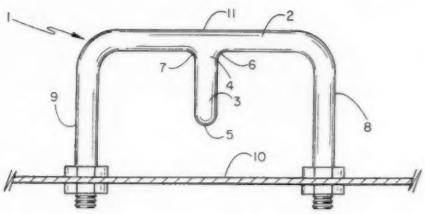
whereby the plastic pipe or duct sections comprie fiberglass and the joint assembly has passed the Factory Mutual #4922 fire test.

US 6,409,230 B1

CINCH CLEAT AND METHOD OF UNIDIRECTIONAL AND BIDIRECTIONAL CINCHING THERETO

Guy J. Entenmann, 802 Bruce Ct., Apt. 2, Menomonie, Wis. 54751

Filed Mar. 19, 2001, Appl. No. 772,414
Int. Cl. B65H *69/04*
U.S. Cl. 289—18.1 **31 Claims**



1. A cinch cleat comprising:

(a) a rigid elongated support member having opposite ends;

(b) at least one post member mounted on said support member between said ends and extending outwardly therefrom to receive a line therearound;

(c) said post member having a free end;

(d) means for mounting said support member upon a supporting surface with said elongated support member and said post member in spaced relation to said supporting surface; and

(e) said free end of said post member extending outwardly from said support member a distance of about one-half the distance between said support member and said supporting surface.

US 6,409,231 B1

FLUSH BOLT MECHANISM

Arturo Rusiana, Algonquin, Ill., assignor to Architectural Builders Hardware Manufacturing Inc., Elk Grove Village, Ill.

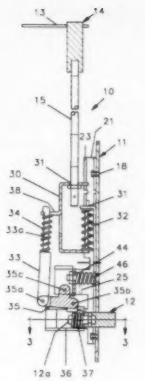
Filed Sep. 30, 1999, Appl. No. 409,496
Int. Cl. E05C *1/06*
U.S. Cl. 292—33 **7 Claims**

1. A flush bolt mechanism for mounting on the free edge of one of a pair of swingable doors for providing latch bolt engagement therebetween when said doors are in a closed position in their associated sash, said flush bolt mechanism comprising:

a frame including a generally flat front sheet adapted for flush mounting on the free edge of said pair of swingable doors, a support bracket secured on a back side of said generally flat front sheet,

said support bracket including an elongate base or bight portion and a pair of elongate opposed side walls extending perpendicularly in like direction from opposing elongate sides of said base,

each of said side walls including an elongate distal wall perpendicular to said side wall in a like direction to said base



defining, with said opposing side wall, a first elongate channel portion parallel to said bight portion,

a second portion of said side wall being flat and perpendicular to said bight portion and extending beyond said distal wall of said first portion, and

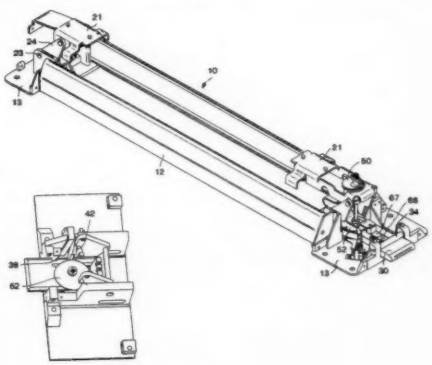
a third portion of said side wall including a main wall extending perpendicularly from said bight portion similarly to said second portion and further including second and third elongate distal walls extending in like direction perpendicular to said main wall and also perpendicular to said bight portion defining with said opposing side wall a substantially square channel.

US 6,409,232 B1

EXIT ALARM LOCK ASSEMBLY WITH PUSH PAD PIVOTALLY INTERCONNECTED TO DEADBOLT

Daniel N. Nigro, Jr., Ocean Springs, Miss., and Eugene Karl Siller, Indianapolis, Ind., assignors to Von Duprin, Inc., Indianapolis, Ind.

Provisional application No. 60/134,014, filed on May 12, 1999. This application May 12, 2000, Appl. No. 569,846.
Int. Cl. E05B *65/10*
U.S. Cl. 292—92 **19 Claims**



1. An exit device comprising:

a push pad moveable between an extended position and a depressed position;

a pivotable first bell crank, a first end of the first bell crank being connected to a first end of the push pad;

a pivotable support connected to a second end of the push pad;

a deadbolt moveable between a retracted position and an extended position, a second end of the first bell crank directly

engaging the deadbolt, whereby when the push pad is moved to the depressed position, the push pad pivots the first bell crank, the first bell crank second end contacts the deadbolt and moves the deadbolt from the extended position to the retracted position; and

a dead locking link for preventing movement of the deadbolt, the dead locking link being moveable between a first position engaging the deadbolt and a second position not engaging the deadbolt whereby, when the push pad is moved to the depressed position, the push pad pivots the first bell crank, the first bell crank contacts the dead locking link and moves the dead locking link out of engagement with the deadbolt.

US 6,409,233 B1

CLOSURE APPARATUS FOR VEHICLE DOOR

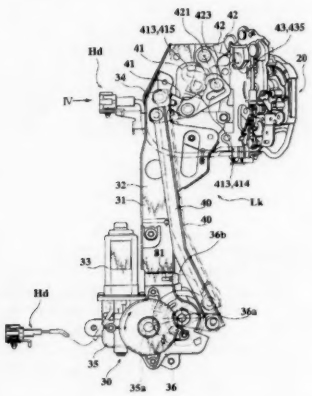
Naoki Hanaki, Yokohama, Japan, assignor to Ohi Seisakusho Co., Ltd., Kanagawa-Ken, Japan

Filed Jun. 19, 2000, Appl. No. 596,582

Claims priority, application Japan, Jun. 18, 1999, 11-173357

Int. Cl. E05C *1/06*

U.S. Cl. 292—144 **4 Claims**



1. A closure apparatus for a vehicle door including a striker disposed on one of a periphery of a door and a periphery of an opening to be closed with the door, and a lock apparatus disposed on the other of the periphery of the door and the periphery of the opening, wherein a driven member of one of the striker and the lock apparatus is forcibly operated with a motive force of a drive motor to bring the door from an incomplete door-close condition to a complete door-close condition, wherein the closure apparatus comprises a main actuation member, a stopper member, a position detector, and a controller, wherein

the main actuation member is movable, relative to a waiting position for the main actuation member to wait for operation of the driven member, on one side to an actuation position for the main actuation member to actuate the driven member and on another side to a detection position for the main actuation member to be detected, with the waiting position therebetween,

the stopper member is configured to limit movement of the main actuation member toward the other side, when the main actuation member is moved to the detection position by rotation of the drive motor in one of forward and reverse directions and brought into contact with the stopper member,

the position detector comprises an electrical value detector configured to detect movement of the main actuation member to the detection position in dependence on a change in an electrical value of the drive motor at a time when the main actuation member comes into contact with the stopper member, and

the controller comprises a motor controller configured to effect a rotation of the drive motor in the other of the forward and reverse directions when the main actuation member is moved to the detection position, and to stop the rotation of the drive motor when the electrical value of the drive motor has a value within an allowable range or when a prescribed amount of Time has elapsed, to return the main actuation member from the detection position to the waiting position.

US 6,409,234 B1

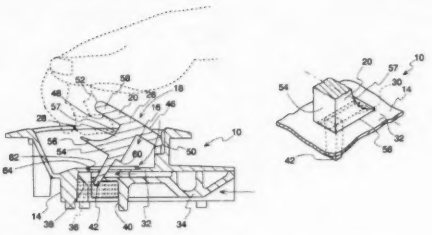
LATCH ASSEMBLY FOR A MOVABLE CLOSURE

Marvin L. Larsen, and Kevin P. Eschweiler, both of New Hampton, Iowa, assignors to Tri/Mark Corporation, New Hampton, Iowa

Filed Nov. 12, 1999, Appl. No. 438,690

Int. Cl. E05C *1/12*

U.S. Cl. 292—173 **19 Claims**



1. A latch assembly for a movable closure, the latch assembly comprising:

a housing having a front, a rear, and a first wall with a forwardly facing surface and an opening through the first wall; and

an actuating assembly comprising a paddle that is pivotably mounted for movement relative to the housing about a first axis between first and second positions,

the paddle having a substantially straight edge extending generally parallel to the first axis over a substantial dimension of the paddle and a second wall with a rearwardly facing surface,

wherein the actuating assembly further comprises a post projecting rearwardly from the second wall into the opening through the first wall,

wherein the post has a third wall which is substantially planar and overlays the full opening through the first wall as viewed from the front of the latch assembly with the paddle in the first position,

wherein the post has an axial dimension parallel to the first axis;

wherein the paddle has a portion that is graspable by a hand of a user with the hand of the user against the straight edge to be drawn forwardly to change the paddle from the first position into the second position,

wherein the post has a concave surface that is substantially continuous and uninterrupted over the axial dimension of the post to receive at least one finger on the hand of a user grasping the graspable portion of the paddle with the hand of the user against the straight edge and the paddle in each of the first and second positions.

US 6,409,235 B1

PANEL FASTENER

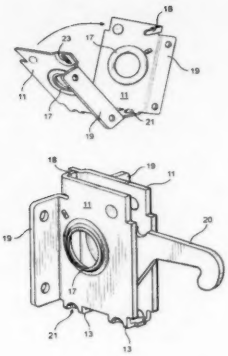
Burl Finkelstein, Newnan, Ga., assignor to Kason Industries, Inc., Shenandoah, Ga.

Filed Dec. 28, 1999, Appl. No. 473,752

Int. Cl. E05L *3/04*

U.S. Cl. 292—210 **4 Claims**

1. A panel fastener comprising a unitary casing having two substantially parallel side walls unitarily connected together at one end by a bridge and held together at an opposite end by a tab



formed unitarily with one of said side walls, the tab extending from said one side wall to the other side wall with a tab end distal said one side wall being bent over the other side wall, and a hook having a mounting end rotatably mounted between and to said casing side walls and having a catch end extending out of said casing, said hook catch end extending out of said casing adjacent said casing tab in one rotary position with said tab serving as a hook rotary stop.

US 6,409,236 B1

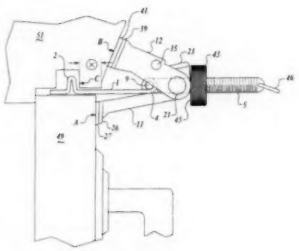
PORTABLE DOOR LOCK

Derek D. Steele, 16 Appletrees Pl., Cinder Path, Woking, Surrey GU22 0HD, United Kingdom

Filed May 18, 2000, Appl. No. 574,589

Int. Cl. E05C *1/02;3/02*

U.S. Cl. 292—291 **15 Claims**



1. A door lock comprising:

(a) a bracket having thereon a protrusion insertable into a lock chamber of a doorframe;

(b) a threaded bolt hingably connected to the bracket;

(c) a hinged brace slidably mounted upon the threaded bolt, the hinged brace comprising a first member adapted to be pressed against a door pivotally connected to a second member adapted to be pressed against the doorframe and a spring mounted on the first member and engaging the second member whereby the second member is urged away from the first member, the second member having at least one stop positioned thereon; and

(d) a thumbwheel mounted upon and threadably engaging the threaded bolt,

whereby when the thumbwheel is urged along the threaded bolt towards the bracket, the hinged brace is urged towards the door thereby pressing the first member against the door and the second member against the doorframe.

US 6,409,237 B1

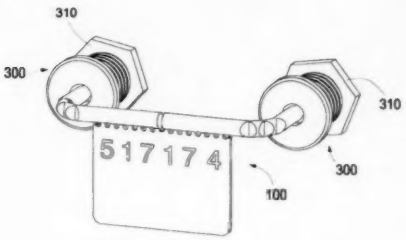
AUTHORIZED-USER, TAG SEPARABLE, TAMPER-EVIDENT SEAL WITH FIXED-IN-PLACE, REUSABLE CATCHES FOR THIN-WALLED CONTAINERS

Michael Cohnitz Olshausen, 1280 21st St. NW. Unit 503, Washington, D.C. 20036

Filed Mar. 2, 2001, Appl. No. 796,655

Int. Cl. B65D *27/30*

U.S. Cl. 292—307 A **17 Claims**



1. A tamper-evident seal comprising an engaging element and two catch elements, said engaging element further comprising

a first arm,

a second arm,

an identifying element,

and a separation means,

said first and second arms being contiguous with said separation means,

said first arm being non-contiguous with said second arm,

said identifying element being contiguous with said separation means,

said first arm and said second arm each having a means adapted for lockably engaging at least one of said catch elements,

said first arm being able to pass in its entirety through the catch element to which said first arm is lockably engaged after said identifying element has been separated from said first arm,

said second arm being able to pass in its entirety through the catch element to which said second arm is lockably engaged after said identifying element has been separated from said second arm,

and in which each said catch element is adapted to be held by mechanical means in an aperture formed in, and extending through, a wall.

US 6,409,238 B1

ANTI-RATTLE STRUCTURE FOR DOOR HANDLE

Mark R. Mikenis, New Lenox; Conrad E. Hlavacek, Peoria; Patrick J. Bowden, Peotone; Donald T. Boone, and Sven E. Carlson, both of Manhattan, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Apr. 26, 2000, Appl. No. 559,891

Int. Cl. E05B *1/00*

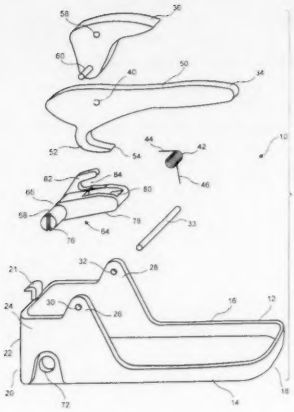
U.S. Cl. 292—347 **10 Claims**

1. A door handle assembly including:

a base element;

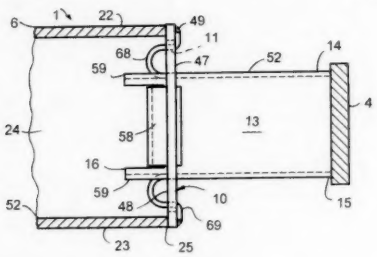
a pivoting element including a journal pivotally engaging a bearing element in said base element; and

a protrusion integrally formed from a portion of said base element and extending toward and bearing against said journal thereby urging said journal against an interior portion of



said bearing element thereby reducing rattling of said journal within said bearing element in a vibratory environment.

US 6,409,239 B1
ENERGY ABSORPTION IMPACT SYSTEM AND METHOD FOR MAKING THE SAME
Todd W. J. Tjoelker; Tyler Steven Hernden, both of Grand Rapids; Craig A. Fellows, Pierson, and Davon M. Browne, Hudsonville, all of Mich., assignors to Benteler Automotive Corporation, Grand Rapids, Mich.
Filed Apr. 17, 2001, Appl. No. 836,008
Int. Cl. B60R *19/34*
U.S. Cl. 293—133 **41 Claims**



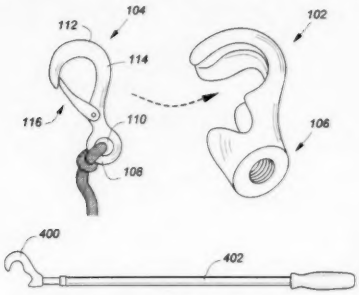
1. An energy absorption impact system for vehicle bumpers comprising:

a base member adapted to be mounted to a vehicle frame, and including a central opening extending therethrough;

an impact receiving member positioned a spaced apart distance from said base member, and configured to be operably connected with an associated vehicle bumper; and

an invertible, tubular energy absorbing crush member having a generally square lateral cross-sectional shape, with generally flat face portions thereof disposed between opposite corner portions thereof; said crush member having a first end thereof connected with said impact receiving member, and a second end thereof with said face portions partially slit longitudinally to define generally planar tabs which are flared outwardly and connected with said base member adjacent said central opening, whereby impact on said impact receiving member forces said crush member through said central opening in said base member, causing said face portions to tear longitudinally away from said corner portions as said crush member inverts through said central opening to absorb energy associated with the impact.

US 6,409,240 B1
WINCH HOOK HOLDER
Don Ferguson, 4462 Huron, Dearborn Heights, Mich. 48125
Filed Sep. 18, 2000, Appl. No. 664,206
Int. Cl. B25J *1/00;* **B63B** *21/54*
U.S. Cl. 294—19.1 **11 Claims**



1. A device for attachment to an elongated handle and for holding a winch hook of the type having a curved back surface and an opposing opening to receive an eyelet, the device comprising:

a body having a proximal end and a distal portion with a hook receiving side and an opposing back side;

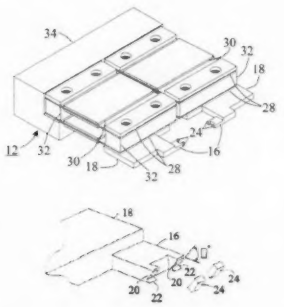
the proximal end including a connector for attaching the body to the elongated handle;

the distal portion including a hook-shaped curved cradle on the hook receiving side for at least temporarily holding the winch hook; and

the cradle featuring a curved recess corresponding to the back surface of the hook and an opening corresponding to the opening of the hook;

whereby the hook may be supported in the cradle and brought to the eyelet and released from the cradle once engaged.

US 6,409,241 B1
APPARATUS FOR GRIPPING CERAMIC SUBSTRATES
Richard P. Hughes, Kanata; Paul S. Ertl, and Keith D. Anderson, both of Nepean, all of Canada, assignors to Nortel Networks Limited, St. Laurent, Canada
Filed Sep. 12, 2000, Appl. No. 660,542
Int. Cl. B25J *15/12*
U.S. Cl. 294—99.1 **18 Claims**



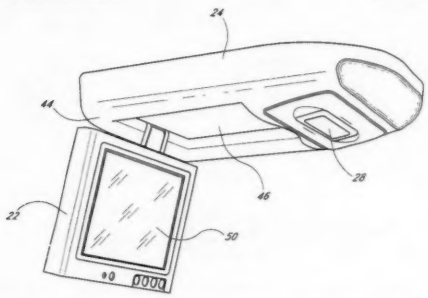
1. A microgripper for aligning a carrier substrate on a base substrate, the microgripper comprising:

(i) a plurality of holders each having one or more faces angled to the horizontal plane, each of said faces having a top edge and a bottom edge;

(ii) an abrasive lining covering said angled faces to form a gripper; and

(iii) a pair of said grippers being configured wherein their angled faces are opposing one another above the horizontal plane, the top edges of said angled face being oriented closest to each other and the bottom edges of said angled faces being oriented furthest from each other, said grippers adapted to being separated to a width required to engage upper edges of a carrier substrate between the top and bottom edges of said angled faces whereby a grip is provided, maintaining consistent contact between said carrier substrate and a base substrate.

US 6,409,242 B1
FLAT THIN SCREEN T/V MONITOR AUTOMOTIVE ROOF MOUNT
Chung L. Chang, 22384 Lazy Trail Rd., Diamond Bar, Calif. 91765
Provisional application No. 60/248,981, filed on Nov. 14, 2000. This application Nov. 21, 2000, Appl. No. 717,928.
Int. Cl. B60N *3/12*
U.S. Cl. 296—37.7 **13 Claims**



1. An assembly mountable on an inside surface of a vehicle roof, said assembly comprising:

a housing having a first side defining a mounting surface and a second side opposite said first side defining a storage location, said housing defining a first hinge portion; and

a video display having a first face defining a video screen and a second face opposite said first face, said video display defining a second hinge portion;

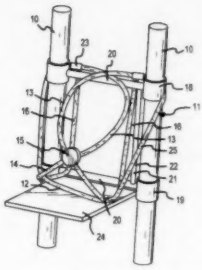
said first hinge portion and said second hinge portion cooperating to pivotably connect said housing and said video display, said first hinge portion and said second hinge portion defining a first axis that is generally parallel to said video screen;

said video display being rotatable about said first axis 180° between a first position wherein said video screen faces said second side of said housing and said second face of said video display is contained within a first plane, and a second position wherein said video screen is contained within said first plane.

US 6,409,243 B1
SAFETY SEAT FOR LAND, AIR AND SEA VEHICLES
Holger Hansen, Hamburg, Germany, assignor to Autoflug GmbH & Co., Germany
PCT No. PCT/DE98/01073, § 371 Date Feb. 14, 2000, § 102(e) Date Feb. 14, 2000, PCT Pub. No. WO98/47762, PCT Pub. Date Oct. 29, 1998
PCT Filed Apr. 17, 1998, Appl. No. 403,446
Claims priority, application Germany, Apr. 18, 1997, 197 16 215
Int. Cl. B60R *22/12;22/18;22/28;* **B60N** *2/42;* **A62B** *35/04*
U.S. Cl. 296—68.1 **14 Claims**

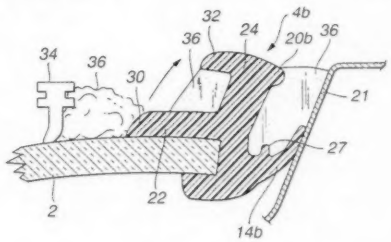
1. A safety seat built into a land, air or sea vehicle, said safety seat having a seating area and a back area and comprising:

a structure that is fixed to a vehicle and comprises vertically disposed side components anchored at seat-width intervals; and



a safety belt member that is secured to said structure and has two shoulder belts and two lap belts, wherein said shoulder belts and said lap belts are joined at a fastener, wherein said safety belt member, as a seat component, has a seat belt that extends transversely between said side components and upwardly along said side components and in an upper region of said back area of said safety seat is connected to each of said side components, wherein said two shoulder belts cross one another between said side components as said two shoulder belts extend from a connection in the vicinity of a respective one of said side components, to the other side component, and then to said fastener, and wherein back belts are provided as support belts and extend from said seat belt, parallel to said side components, upwardly to said shoulder belts, where said back belts are connected.

US 6,409,244 B1
AUTOMOTIVE WINDOW MOLDING
Yuuji Nagahashi, Chiba; Akira Hoshikawa, Gunma; Takeshi Arai, Gunma, and Yukio Furugori, Gunma, all of Japan, assignors to Kinugawa Rubber Ind., Co., Ltd., Chiba, and Fuji Jukogyo Kabushiki Kaisha, Tokyo, both of Japan
Filed Dec. 18, 2000, Appl. No. 738,861
Claims priority, application Japan, Dec. 20, 1999, 11-360505
Int. Cl. B60J *10/02*
U.S. Cl. 296—93 **6 Claims**



1. An automotive window molding attached onto a circumference of a window glass and arranged at a pillar side of a vehicle body, comprising:

a leg portion disposed between the circumference of the window glass and a vehicle-body panel;

an outside glass abutting portion being in contact with an outside surface of the window glass and arranged along the outside surface of the window glass to extend toward an inside of a perimeter of the window glass;

an inside glass abutting portion being in contact with an inside surface of the window glass and arranged along the inside surface of the window glass to extend toward the inside of the perimeter of the window glass;

a seal lip portion extending from an outer surface of the leg portion facing the vehicle-body panel and abutting at a tip thereof with the vehicle-body panel while being curved toward an outside of the vehicle body;

an outside ornamental head portion arranged outside of the outside glass abutting portion and spaced apart from the outside glass abutting portion so that the outside ornamental head portion and the outside glass abutting portion are opposed to each other;

a connecting wall portion interconnecting the outside ornamental head portion and the outside glass abutting portion; and

a drip groove defined by the outside glass abutting portion, the outside ornamental head portion, and the connecting wall portion, so that the drip groove is opened toward the inside of the perimeter of the window glass;

wherein a tip portion of the outside glass abutting portion is configured to protrude toward the inside of the perimeter of the window glass more than a tip portion of the outside ornamental head portion protrudes toward the inside of the perimeter of the window glass, and

which further comprises a drain groove formed between the leg portion and the vehicle-body panel by abutment of the seal lip portion with an outer surface of the vehicle-body panel in an outwardly-curved fashion so that the drain groove is opened toward the outside of the vehicle body, and a protruded portion formed at a bottom of the drain groove.

US 6,409,245 B1

SUNVISOR ASSEMBLY HAVING A ROUNDED EDGE

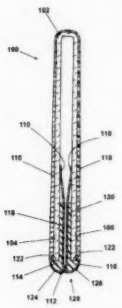
Willard E. Crotty, III, 89 Miller Dr., Quincy, Mich. 49082, and Mark A. Tom, 9914 Tomahawk Trail, Coldwater, Mich. 49036

Division of application No. 09/515,315, filed on Feb. 29, 2000, now Pat. No. 6,302,467, Provisional application No. 60/122,298, filed on Mar. 1, 1999. This application Aug. 1, 2001, Appl. No. 920,129.

This patent is subject to a terminal disclaimer.

Int. Cl. B60J *3/00*

U.S. Cl. 296—97.1 **3 Claims**



1. A sun visor assembly comprising a substantially flat foundation folded unto itself and having an upholstery cover covering the foundation and forming an exterior surface of the sun visor:

a pair of substantially identical elongate bead members sections, each of which comprises a bulbous portion having a stem portion extending therefrom, said bulbous portions being capable of alignment with one another to form a rounded member whose surface comprises a substantially semicircular cross section having a radius of at least 2.5 mm.

US 6,409,246 B1

SNAP-IN HINGED VISOR EXTENDER

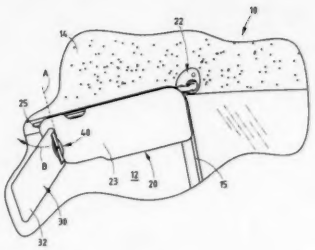
Eric D. Rennie, Spring Lake, Mich., assignor to Johnson Controls Technology Company, Plymouth, Mich.

Filed Aug. 13, 2001, Appl. No. 928,551

Int. Cl. B60J *3/02*

U.S. Cl. 296—97.6 **20 Claims**

1. A visor extender panel assembly for a vehicle visor, said assembly comprising:



an extender panel;

a mounting bracket for attaching said extender panel to a visor body; and

a hinge coupling said extender panel to said mounting bracket for allowing the rotation of said extender panel with respect to the mounting bracket, such that when said mounting bracket is attached to a visor panel, said extender panel can be moved between a closed position in which the extender panel is adjacent a visor body and an extended position in which said extender panel extends outwardly from the visor body, wherein said hinge comprises a spring extending from said mounting bracket and including a hook, and said extender panel includes a pivot rod over which said hook extends for coupling the extender panel to said mounting bracket and allowing rotation of said extender panel with respect to said mounting bracket.

US 6,409,247 B1

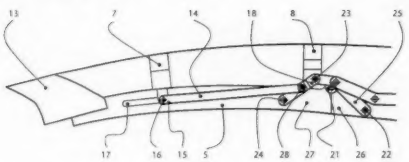
CONVERTIBLE VEHICLE WITH AN AT LEAST PARTIALLY FLEXIBLE ROOF AND AT LEAST ONE CROSS-CONNECTING SUPPORT

Joachim Maass, Bissendorf, Germany, assignor to Wilhelm Karmann GmbH, Osnabrueck, Germany

Filed Dec. 20, 2000, Appl. No. 745,164

Int. Cl. B60J *7/12*

U.S. Cl. 296—107.13 **19 Claims**



1. An operable mechanisms for use with a roof for a convertible vehicle in which the roof is movable between up and down positions, comprising generally elongated side supports extending generally in a direction from front to rear of the vehicle when the roof is in the up position, at least one cross support extending generally transversely of said side supports, mounting portions movably mounting said at least one cross support on said side supports to provide for displacement of said at least one cross support relative to the elongated extent of said side supports, and a control device which effects said displacement when said roof is moved between said up and down positions.

US 6,409,248 B1

DUAL PIVOTING BOW ASSEMBLY FOR USE WITH A REMOVABLE SOFT TOP PORTION OF A JEEP-TOP COVER

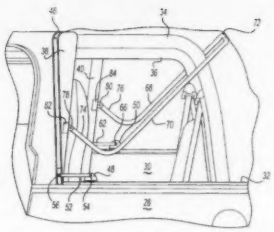
Carol Bores, 30606 Munger, Livonia, Mich. 48154

Filed Aug. 31, 2000, Appl. No. 651,951

Int. Cl. B60J *7/00;7/08*

U.S. Cl. 296—122 **6 Claims**

1. A dual bow assembly for supporting a flexible covering member of a Jeep-type vehicle, the vehicle including a forwardly



situated seating area and a rearwardly situated storage area defined by a belt line extending around sides and a rear of the vehicle, a pair of spaced apart roll bars extending along the seating and storage area of the vehicle and the flexible covering member being associated with the vehicle storage area, said dual bow assembly comprising:

a first substantially "U" shaped bow adapted to being located proximate a forward end of the vehicle storage area and enveloping the spaced apart roll bars, opposing and linearly extending ends of said first bow each including a linkage member pivotally associated with said linearly extending ends at a first location, said linkage members each pivotally engaging the vehicle belt line at a second location;

a second generally U-shaped bow enveloping the spaced apart roll bars and having first and second opposing ends adapted to being secured to the storage area of the vehicle;

a flexible cover having an area defined by a top and at least one side which overlays said second U-shaped bow and is secured to said first U-shaped bow and to at least a portion of the sides and rear of the vehicle; and

said first bow and said second bow pivoting about a pivot point and in directions between the sides and rear of the vehicle and to selectively install and remove said flexible cover from the storage area of the vehicle.

US 6,409,249 B1

AUTOMOBILE DOOR HANDLE

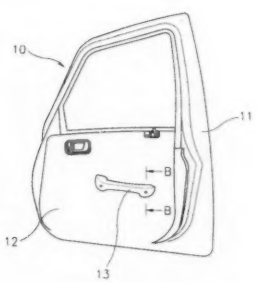
Kyung-Sik Han, Ulsan, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Oct. 4, 2000, Appl. No. 679,942

Claims priority, application Rep. of Korea, Dec. 31, 1999, 99-68305

Int. Cl. B60N *3/02;* **B60J** *5/02*

U.S. Cl. 296—146.7 **4 Claims**



1. An automobile door handle, the handle comprising: a handle part;

a boss part extending from the handle part and coupled to a door panel; and

strength weakening means for weakening the structural strength of the boss part in order to break the boss part when shock of more than a predetermined size is applied to the boss part.

US 6,409,250 B1

MOTOR VEHICLE DOOR WITH A DOOR BODY SEPARATED INTO A WET AREA AND A DRY AREA

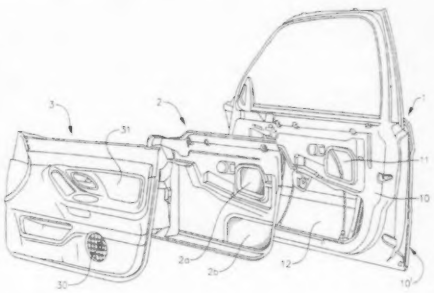
Wolfgang Schultheiss, Ebersdorf, Germany, assignor to BROSE Fahrzeugteile GmbH & Co. KG, Coburg, Coburg, Germany

Filed Nov. 13, 2000, Appl. No. 712,689

Claims priority, application Germany, Nov. 13, 1999, 199 54 648

Int. Cl. B60J *5/00*

U.S. Cl. 296—146.7 **18 Claims**



1. A motor vehicle door comprising a door body separated by a separator into a wet area and a dry area, whereby the wet area is bounded on one side by an outer door panel and on the other side by a first side of the separator, the dry area is bounded by at least a second side of the separator opposite the first side of the separator and extends in a direction towards the vehicle interior, wherein the separator includes an air-permeable pressure equalization element.

US 6,409,251 B1

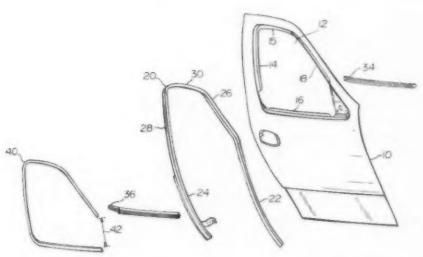
GLASS RUN SURROUND CAP

Randy L. Kaye, Shelby Township, and Adolfo Enrico Milani, Oakland, both of Mich., assignors to Schlegel Corporation, New York, N.Y.

Filed May 27, 1999, Appl. No. 320,993

Int. Cl. B60J *10/08;* **E06B** *7/18;7/22*

U.S. Cl. 296—146.9 **16 Claims**



1. A decorative vehicle window surround sealing system comprising:

a plurality of window seals attached directly to a vehicle body for sealing a window panel and each said seal having an exterior surface;

a one piece decorative surround cap substantially covering the exterior surface of each of the seals; and

a fitting on the surround cap and a cooperative fitting on at least one of the plurality of seals for attaching to the surround cap wherein the cooperative fitting consists of a t-shaped lug attached to the fitting on the surround cap.

US 6,409,252 B1

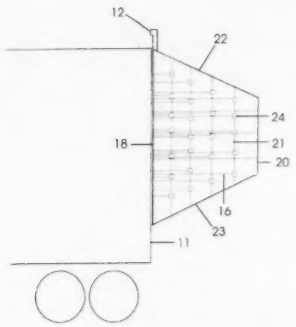
TRUCK TRAILER DRAG REDUCER

Paul Guy Andrus, 46 Wiltshire Place, Ancaster On., Canada, L9K 1M5

Filed Sep. 24, 2001, Appl. No. 960,781

Int. Cl. B62D *35/00*

U.S. Cl. 296—180.4 **4 Claims**



1. An inflatable drag reducer adapted to be mounted on the rear doors of a standard transport trailer, said drag reducer comprising a pair of flexible enclosed bags with one bag mounted onto each of the two trailer doors, said bags having a base surface adjacent to said trailer doors, said bags having adjacent medial surfaces, said bags having lateral, upper, and lower surfaces over which air passes during forward motion of said trailer, said bags containing an array of internal inelastic cords extending horizontally from the medial edge of said base surfaces to said lateral surfaces at equally spaced points, said bags containing a second array of internal inelastic cords extending vertically from said upper surfaces at equally spaced points to said lower surfaces at equally spaced points, such that upon inflation said drag reducer assumes a pyramidal shape with said lateral, upper and lower surfaces being substantially planar.

US 6,409,253 B2

FRONT STRUCTURE IN A VEHICLE

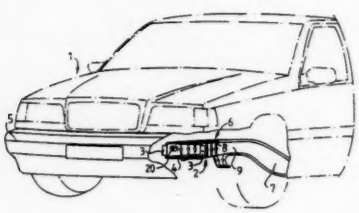
Johnny K Larsson, Gothenburg, and Clas Jernström, Askim, both of Sweden, assignors to Volvo Car Corporation, Sweden

Continuation of application No. 09/308,326, filed as application No. PCT/SE97/01960, filed on Nov. 21, 1997, now Pat. No. 6,302,476. This application Sep. 7, 2001, Appl. No. 682,490.

Claims priority, application Sweden, Nov. 21, 1996, 9604275

Int. Cl. B62D *21/15*

U.S. Cl. 296—188 **7 Claims**



1. Frontal structure in a vehicle, comprising:

a pair of laterally spaced beams, each comprising a sheet metal box element having a greater length than both width and height, and having a portion which is oriented in the longitudinal direction of the vehicle; and

means for sensing the retardation of the vehicle during a collision and, as a function thereof, differently changing the rigidity of each beam in its longitudinal direction based on the retardation of the vehicle.

US 6,409,254 B2

CAB FRAME FOR AN AGRICULTURAL MACHINE

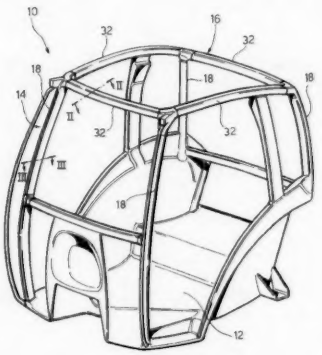
Salvini Tiziano, Treviglio, Italy, assignor to Same-Deutz-Fahr SpA, Italy

Filed Jan. 3, 2001, Appl. No. 753,631

Claims priority, application European Pat. Off., Jul. 28, 2000, 830538

Int. Cl. B60R *27/00*

U.S. Cl. 296—190.08 **7 Claims**



1. A frame for a cab for an agricultural machine, said frame comprising:

a plurality of uprights, said uprights being formed of a first series of sectional elements with cross-sections equal to one another; and

a structure for supporting a roof, said structure being formed of a second series of sectional

elements with cross sections equal to one another, said structure being positioned on top of said plurality of uprights;

wherein said sectional elements of said first series of sectional elements have a cross section

having two parallel rectilinear sides, an arched portion, and two inclined sides having outer surfaces for resting weatherstripping.

US 6,409,255 B2

VEHICLE BODY FOR A FORWARD VEHICLE STRUCTURE OF A MOTOR VEHICLE AND METHOD OF MAKING SAME

Michael Tilsner, Wiernsheim; Rainer Stahl, Markgroeningen, and Matthias Herntier, Wurmberg, all of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany

Filed May 11, 2001, Appl. No. 853,082

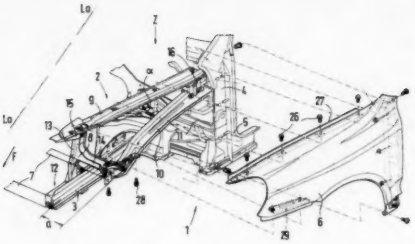
Claims priority, application Germany, May 11, 2000, 100 23 193

Int. Cl. B60D *27/02*

U.S. Cl. 296—194 **31 Claims**

1. Vehicle body for a forward vehicle structure of a motor vehicle, having laterally extending vehicle side members as well as a support structure fastened thereto which can be connected with an A-column of the vehicle body, a fender being fastened on the support structure,

wherein the support structure has one T-shaped profile support respectively for each vehicle side which is connected on a forward end with a respective vehicle side member, each



T-shaped profile support member including an upward-extending foot web connected to a forward end of a fender panel and, a transversely outward-directed center web connected with a forward end of a fender support.

US 6,409,256 B1

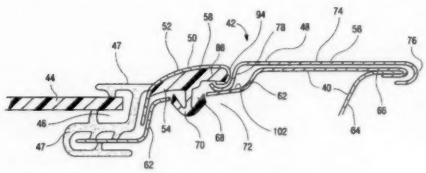
MULTI-PIECE APPLIQUE FOR VEHICLE B-PILLAR

Michael Page, Casco, Mich., assignor to Guardian Industries Corp., Auburn Hills, Mich.

Filed Jan. 23, 2001, Appl. No. 766,671

Int. Cl. B60J *7/00*

U.S. Cl. 296—203.03 **14 Claims**



1. A vehicle B-pillar assembly comprising:

a B-pillar;

a door structure including first and second pieces of sheet metal which are connected to one another at a flange portion of the door structure;

a applique including at least first and second partially overlapping pieces for attachment to the door structure;

wherein a first end portion of said first piece of said applique is at least partially wrapped around said flange portion of the door structure, and at least a portion of a second end of said first piece is located between said door structure and said second piece of said applique; and

wherein said second piece of said applique includes at least one fastener for helping to retain the applique on said door structure, and wherein said second piece of said applique is positioned relative to said first piece of said applique in a partially overlapping manner so as to help hold said second end of said first piece in position.

US 6,409,257 B1

VEHICLE SIDE SILL STRUCTURE

Katsuhiko Takashina, Okazaki; Hiroyuki Nagura, Anjo, and Hiroyuki Kurokawa, Nisshin, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

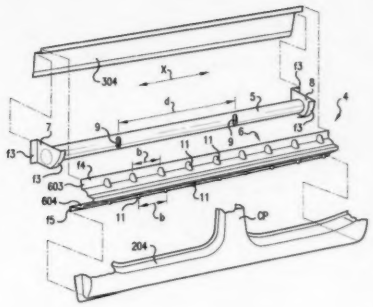
Filed Oct. 11, 2001, Appl. No. 973,707

Claims priority, application Japan, Oct. 11, 2000, 2000-310880

Int. Cl. B62D *27/02*

U.S. Cl. 296—209 **6 Claims**

1. A vehicle side sill structure in which a side sill portion having a substantially closed section extending in a longitudinal direction of a vehicle body is provided at a side of the vehicle body, comprising:



a center pillar joined to an intermediate section of the side sill portion and extended upward;

a pipe member disposed inside said side sill portion and extended in the longitudinal direction of the vehicle body, at least two fragile portions being formed in a side portion of said pipe member across the intermediate section; and

a reinforcing member disposed substantially along the side portion of said pipe member to cover the fragile portions, and cooperating with said side portion to form a second closed section.

US 6,409,258 B1

VEHICLE ROOF MODULE WITH INTEGRAL SUNROOF UNIT

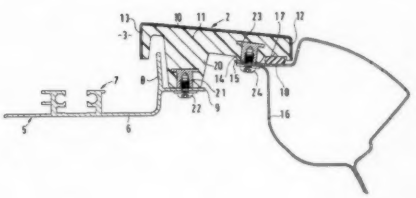
Rainer Grimm, and Horst Böhm, both of Frankfurt, Germany, assignors to Meritor Automotive GmbH, Frankfurt, Germany

Filed Sep. 28, 2000, Appl. No. 672,403

Claims priority, application Germany, Sep. 29, 1999, 199 46 804

Int. Cl. B60J *7/00*

U.S. Cl. 296—216.08 **12 Claims**



1. A vehicle roof comprising:

a roof skin comprising an inner surface with an inner shell of plastics foam foamed on said inner surface,

the roof being positionable on and firmly connectable to vehicle bodywork,

the roof further comprising all opening in the roof skin closable by a sliding cover of a sunroof and a frame beneath the roof skin for mounting and guiding operating elements of the sunroof,

wherein said frame is attached firmly to said inner shell at a plurality of spaced downwardly projecting pedestals distributed around said opening by fastenings present only at said downwardly projecting pedestals, such that said fastenings and said inner shell cooperate to provide the exclusive support for said frame.

US 6,409,259 B1

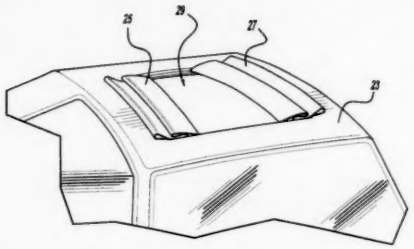
AUTOMOTIVE VEHICLE SUNROOF

Jeffrey S. Patelczyk, Woodhaven, Mich., and Gregory M. Beauprez, Toledo, Ohio, assignors to ASC Incorporated, Southgate, Mich.

Filed Apr. 10, 2000, Appl. No. 545,943

Int. Cl. B60J *7/12*

U.S. Cl. 296—219 **54 Claims**



32. An automotive vehicle sunroof comprising:

a member having a surface defining an internal sunroof opening, the surface also defining at least one vertical plane;

a sunroof cover having a first section and a second section; and

a mechanism movably coupling the cover to the member;

wherein the first and second sections of the cover are stacked in a substantially overlapping manner when the cover is retracted in a cross-car direction to an open position, the cover being at least partially outboard of the plane when in the open position.

US 6,409,260 B1

ADJUSTMENT DEVICE FOR A MULTI-SPOILER ROOF FOR VEHICLES

Horst Bohm, and Rainer Grimm, both of Frankfurt, Germany, assignors to Meritor Automotive GmbH, Frankfurt, Germany

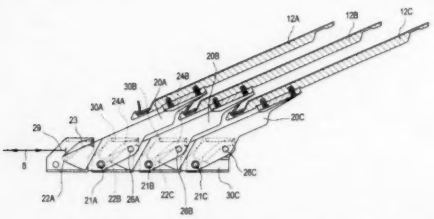
PCT No. PCT/EP00/00918, § 371 Date Dec. 26, 2000, § 102(e) Date Dec. 26, 2000, PCT Pub. No. WO00/48857, PCT Pub. Date Aug. 24, 2000

PCT Filed Feb. 5, 2000, Appl. No. 673,363

Claims priority, application Germany, Feb. 15, 1999, 299 02 662

Int. Cl. B60J *7/047*

U.S. Cl. 296—220.01 **15 Claims**



1. Adjustment device for a vehicle sliding roof (**11**), having at least two lamellas (**12**A, **12**B, **12**C) for a choice of closing and at least partially uncovering a roof opening (**14**) in a fixed roof surface (**16**) of a vehicle and with which the roof opening (**14**) is limited by a base part (**13**) fixed to the vehicle with side parts (**18**) opposite one another, defaming a longitudinal direction (D),

with at least one lamella support element (**20**A, **20**B, **20**C) each connected with the assigned lamella (**12**A, **12**B, **12**C), which can be swiveled around a swivel pin (**21**A, **21**B, **21**C) running cross-wise to the longitudinal direction (D) and which can be moved along the longitudinal direction (D),

with at least one guide element (**32**) provided on the base part (**13**), extending along the longitudinal direction (D),

with at least one lamella support carriage (**30**A, **30**B, **30**C) each per lamella (**12**A, **12**B, **12**C), which is guided along the guide element (**32**) so as to be movable and which moves the assigned lamella (**12**A, **12**B, **12**C),

with control elements (**26**A, **28**A, **26**B, **28**B; **26**C, **28**C), which define the movement of the lamella support elements (**20**A, **20**B, **20**C) during the movement of the lamella support carriages (**30**A, **30**B, **30**C) along the guide element (**32**) and

with drive elements (**8**) for opening and closing the vehicle sliding roof,

characterized by

a drive carriage (**29**) being provided, which is arranged so as to be movable in the guide element (**32**), viewed in the direction of travel, in front of the lamella support carriages (**30**A, **30**B, **30**C) and which is connected with the drive elements (**8**), and

swiveling and coupling elements for swiveling a lamella and for connecting and disconnecting again two carriages being provided; one set of which acts between the drive carriage (**29**) and the first lamella support element (**20**A) and the others acting between the lamella support carriages (**30**A, **30**B) and the respective, neighboring lamella support elements (**20**B, **20**C), and which engage at stipulated positions when the vehicle sliding roof (**11**) is opened and which disengage from each other again at the stipulated positions when the vehicle sliding roof (**11**) is closed.

US 6,409,261 B1

OPENABLE MOTOR VEHICLE ROOF AND SWITCHING ELEMENT FOR ACTUATING THE OPENABLE MOTOR VEHICLE ROOF

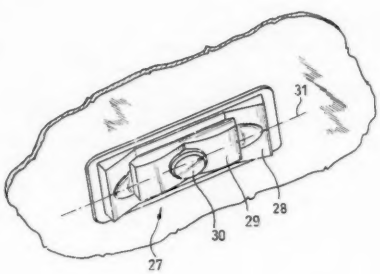
Franz Lindinger, München, and Frank Wätzig, Hochstadt, both of Germany, assignors to Webasto Karosseriesysteme Gmbh, Stockdorf, Germany

Filed Jun. 2, 1999, Appl. No. 323,691

Claims priority, application Germany, Jun. 2, 1998, 198 24 515

Int. Cl. B60J *7/057*

U.S. Cl. 296—223 **14 Claims**



1. Switching element for actuating an openable motor vehicle roof in which at least an outer cover part is actuatable for closing and at least partially exposing of a roof opening in a fixed roof surface by means of a first drive and in which at least one inner cover part is actuatable by means of a second drive, comprising a first control for selection and actuation of the outer cover part and a separate second control for selection and actuation of the inner cover part; wherein the first control and the second control are combined in a single switching element and are located extending along a common axis; wherein one of the controls is encompassed within a perimeter of the other control in a manner enabling simultaneous actuation of the drives for both the at least one outer cover part and said at least one inner cover part in the same manner with respect to said common axis.

US 6,409,262 B1

ALL-LINKAGE RECLINING CHAIR WITH IMPROVED TENSIONING MECHANISM

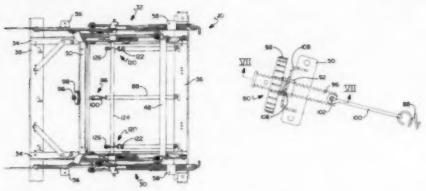
Larry P. LaPointe, Temperance, Mich., assignor to La-Z-Boy Incorporated, Monroe, Mich.

Continuation-in-part of application No. 09/322,866, filed on May 28, 1989, now Pat. No. 6,145,924, which is a continuation-in-part of application No. 09/062,634, filed on Apr. 17, 1998, now Pat. No. 5,975,627, which is a continuation-in-part of application No. 08/855,031, filed on May 13, 1997, now Pat. No. 5,992,930. This application Apr. 5, 2000, Appl. No. 543,431.

This patent is subject to a terminal disclaimer.

Int. Cl. A47C *1/02*

U.S. Cl. 297—68 **15 Claims**



1. A reclining mechanism comprising:

a base frame;

a support linkage assembly including a first support linkage pivotally coupled to said base frame, a second support link pivotally coupled to said base frame, and an intermediate link pivotally coupled to said first support linkage at a first pivot and pivotally coupled to said second support link at a second pivot;

an adjustable drive spring assembly operably disposed between said base frame and said first support linkage to forwardly bias said support linkage assembly, said drive spring assembly including a spring member having a first end connected to said base frame and a second end operably coupled to said second support link and a tension adjusting mechanism for adjusting the tension in said spring.

US 6,409,263 B1

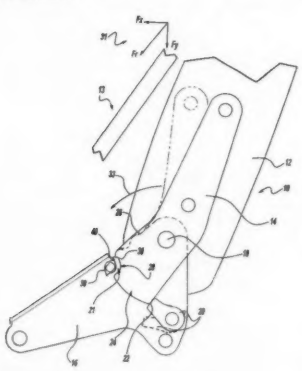
DUMP LATCH WITH DEFORMABLE LOCK

Kurt A. Seibold, South Lyon, Mich., assignor to Johnson Controls Technology Company, Plymouth, Mich.

Filed Jan. 18, 2000, Appl. No. 487,369

Int. Cl. B60N *2/42*

U.S. Cl. 297—216.13 **12 Claims**



1. A seat assembly comprising:

a seat back operable to be displaced between a seat forming position and a stowed position;

a latch mechanism providing support for said seat back, said latch mechanism comprising a support member having an engagement surface and a base plate having a stop, wherein said base plate includes a buckle zone, said buckle zone able to deflect under a force from a collision or rapid deceleration such that said engagement surface contacts said stop, said latch mechanism further comprises a rotatable cam to latch said support member and said seat back in said seat forming position, said engagement surface is profiled to mate with said stop, and wherein said stop includes at least one projection that couples to at least one indentation in said engagement surface when said buckle zone deflects.

US 6,409,264 B1

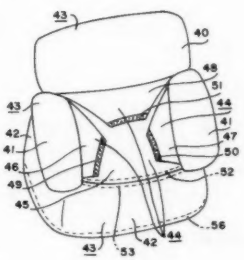
INTERCHANGEABLE FURNITURE COVER SYSTEM

Johnnie Palmer, 830 C.R. 310, Tiplersville, Miss. 38674, and Joan Lewellen, 1108 City Ave., N., Ripley, Miss. 38663

Filed Mar. 1, 2000, Appl. No. 516,696

Int. Cl. A47C *21/00;31/02*

U.S. Cl. 297—218.3 **6 Claims**



1. A seat member to support a human body comprising a frame and a reversibly attachable cover, said frame comprising a base frame member, two arm frame members, a back frame member and a seat decking member, said base frame member having a bottom surface with means to attach said reversibly attachable cover and said seat decking member having a means to attach said reversibly attachable cover; said reversibly attachable cover consisting essentially of an inner surface and an outer surface, said inner surface having a first area shaped substantially like a seat, said area shaped substantially like a seat having means to attach to said seat decking member and a second area with flaps projecting downwardly from said area shaped substantially like a seat, said flaps having means to attach to said bottom surface of said base frame member;

and said outer surface of said reversibly attachable cover, forming the shape of said seat member, and said outer surface having a plurality of means on a bottom inside edge of said outer surface to attach said outer surface to said bottom surface of said base frame member.

US 6,409,265 B1

TILTING AND RECLINING WHEELCHAIR

James M. Koerlin, Broomfield, and Karen A. Hada, Boulder, both of Colo., assignors to Sunrise Medical HHG, Inc., Longmont, Colo.

Filed May 31, 2000, Appl. No. 583,852

Int. Cl. A47C *1/02;* **B60N** *2/02*

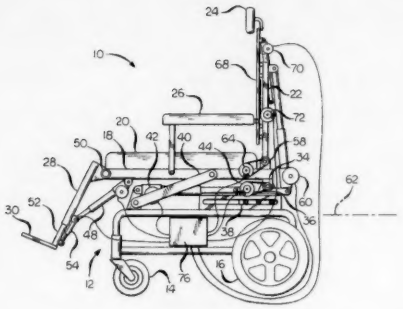
U.S. Cl. 297—325 **7 Claims**

1. A wheelchair having a base and further comprising:

a seat frame mounted for tilting with respect to the base;

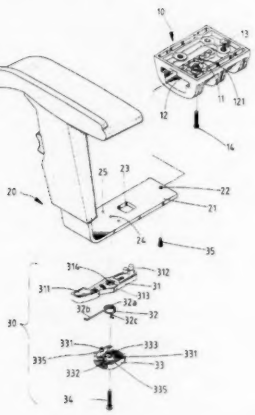
a strut pivotally mounted at a first end on a forward end of the base and pivotally connected at a second end to the seat frame;

an actuator pivotally mounted to the base and pivotally mounted directly to the strut;



wherein, extension of the actuator rotates the strut with respect to the base, thereby tilting the seat frame with respect to the base.

US 6,409,266 B1
DEVICE FOR ADJUSTING LATERAL POSITION OF A CHAIR ARMREST
Su-Jan Chen, P.O. Box 63-247, Taichung, Taiwan
Filed Nov. 21, 2000, Appl. No. 716,647
Int. Cl. A47C *7/54*
U.S. Cl. 297—411.37 **16 Claims**



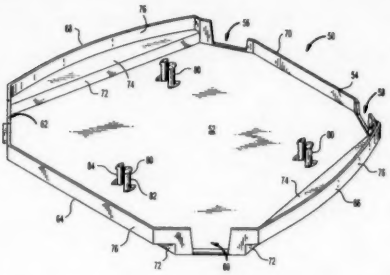
1. A device for adjusting lateral position of an armrest of a chair relative to a seat of the chair, the device comprising:

a base securely attached to a seat of a chair, the base including a plurality of positioning holes;

an extension extended from an armrest of the chair, the extension being slidably received in the base and slidable in a lateral direction relative to the seat; and

a positioning member including an intermediate portion pivotally attached to the extension about an axis perpendicular to the extension and the lateral direction, having a first operative end, and a second end releasably engaged with at least one of the positioning holes.

US 6,409,267 B1
SHROUD FOR THE UNDERSIDE OF A CHAIR, AND A MOLDED SEAT FRAME FOR USE THEREWITH
Joseph J. Pietrzak, 8 Selma Dr., Jamesburg, N.J. 08831
Division of application No. 09/205,786, filed on Dec. 4, 1998, now Pat. No. 6,149,240. This application Nov. 15, 2000, Appl. No. 713,690.
Int. Cl. A47C *7/00*
U.S. Cl. 297—440.22 **5 Claims**



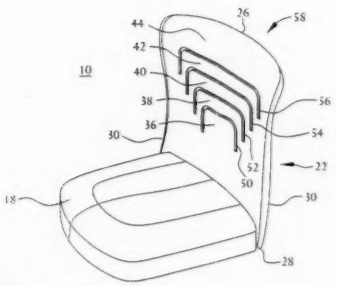
4. A shroud for a chair of a type having a seat and at least one leg connected to an underside of the seat, comprising

a generally flat panel having a first portion adapted to overlie one portion of the underside of the seat, said first portion having a mating edge with a recess formed in said mating edge, and a second portion adapted to overlie another portion of the underside of the seat, said second portion having a mating edge with a recess formed in said mating edge;

a lip projecting from a peripheral edge of said panel; and

each of said first and second portions having at least one connecting member adapted to engage a complementary connecting member on the underside of the seat for removably connecting said first and second portions in an assembled position to the seat, said recesses in said first and second portions in said assembled position being aligned with one another to define an aperture in said panel to receive the at least one leg of the chair.

US 6,409,268 B1
FLEXIBLE CHAIR BACK
Sava M. Cvek, Jamaica Plain, Mass., assignor to Stylex, Inc., Delanco, N.J.
Filed Jun. 9, 2000, Appl. No. 590,938
Int. Cl. A47C *7/40*
U.S. Cl. 297—452.29 **19 Claims**



1. A flexible chair back,

said chair back comprising a back supporting surface,

a plurality of generally downwardly directed curvilinear shaped openings formed in said back supporting surface in a vertical array,

each of said curvilinear openings being around the next adjacent lower curvilinear opening,

said curvilinear shaped openings being U-shaped and defining a plurality of upwardly directed back supporting members, and

said back supporting members flex around horizontal axes to follow the curvature of the back.

US 6,409,269 B1

VEHICLE SEAT ASSEMBLY WITH THERMOFORMED FIBROUS SUSPENSION PANEL

Silvio Aebischer, Grand Rapids; Thomas J. Dellinger; Eric Burmeister, both of Zeeland, and Neil J. Bush, Pinckney, all of Mich., assignors to Johnson Controls Technology Company, Plymouth, Mich.

Division of application No. 09/076,544, filed on May 12, 1998, now Pat. No. 6,213,557. This application Nov. 2, 2000, Appl. No. 705,144.

Int. Cl. B60N *2/50*

U.S. Cl. 297—452.55 **10 Claims**

1. A vehicle seat assembly comprising:

a generally horizontal seat bottom;

a seat back extending generally upwardly at a rear end of the seat bottom;

the seat back having a frame with spaced apart frame members coupled to a cross member;

a suspension panel having at least one corrugation to provide differing degrees of flexibility at different locations on the suspension panel and a forwardly projecting lower portion in a lumbar region and a corresponding recess on a rear side of the suspension panel providing increased space for an occupant seated behind the seat assembly, the suspension panel mounted to the spaced apart frame members and spanning across the seat between the frame members;

a seat pad carried by the suspension panel such that the suspension panel transmits seating loads from the seat pad to the frame; and

the suspension panel being a thermally molded compressed fibrous bat impregnated with a thermoplastic resin, and the fibrous bat is non-woven randomly oriented fibers selected from the group consisting of thermoformable plastic fibers and natural fibers thereby increasing recycleability of the suspension panel.

US 6,409,270 B1

AUTOMOTIVE SEAT BELT CLAMPING DEVICE

Klaus Meder, Tomioka, Japan, assignor to Robert Bosch GmbH, Stuttgart, Germany

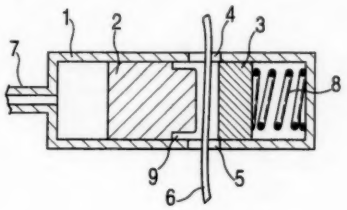
PCT No. PCT/DE98/00526, § 371 Date Mar. 7, 2000, § 102(e) Date Mar. 7, 2000, PCT Pub. No. WO98/56625, PCT Pub. Date Dec. 17, 1998

PCT Filed Feb. 21, 1998, Appl. No. 445,674

Claims priority, application Germany, Jun. 12, 1997, 197 24 876

Int. Cl. B60R *21/00*

U.S. Cl. 297—464 **7 Claims**



1. A clamping device for use with a seat belt of a motor vehicle, the clamping device arresting the seat belt in response to a braking device, comprising:

a cylinder including a first piston and a second piston, the first piston and the second piston being movably supported along a longitudinal axis of the cylinder, the cylinder having a cylinder wall with slots,

wherein the slots are positioned to accommodate the seat belt at right angles to the longitudinal axis between the first piston and the second piston,

wherein a first force is exerted on the first piston, the first force being dependent upon a brake pressure, and

wherein a second force is directed at the second piston, the second force being opposition to the brake pressure.

US 6,409,271 B1

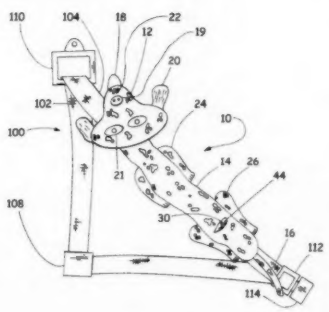
COMBINED SEAT BELT COVER AND PILLOW

Lisa Caramanis, 143 Partridge Dr., Middleton, N.H. 03887

Filed Jul. 13, 2000, Appl. No. 615,186

Int. Cl. B60R *22/00*

U.S. Cl. 297—482 **20 Claims**



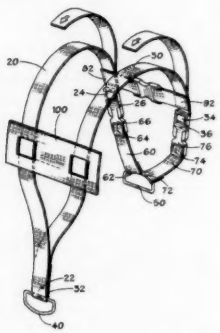
1. A combined seat belt cover and pillow for use relative to a vehicular seat belt arrangement with at least one elongate seat belt to enhance the comfort and safety of a vehicular occupant, the combined seat belt cover and pillow comprising:

an elongate seat belt cover with a first end, a second end, an elongate body portion, and a means for surrounding at least a portion of the elongate seat belt; and

a pillow coupled to the elongate seat belt cover adjacent to the first end of the elongate seat belt cover whereby the elongate body portion of the elongate seat belt cover extends away from the pillow in a single direction only toward the second end of the elongate seat belt cover;

whereby the combined seat belt cover and pillow can be coupled to the elongate seat belt of the vehicular seat belt arrangement with the elongate seat belt cover providing cushioning between the elongate seat belt and the vehicular occupant and dispersing a force of the elongate seat belt against the vehicular occupant and with the pillow providing added lateral cushioning for the head of the vehicular occupant.

US 6,409,272 B1
CHILD SAFETY RESTRAINT
Lauree Martin, Iola, and Anne Christian, Garland, both of Tex., assignors to Propedia, L.L.C., Iola, Tex.
Filed Jul. 20, 2000, Appl. No. 621,278
Int. Cl. A47D *15/00*
U.S. Cl. 297—484 **25 Claims**



1. A child safety apparatus adapted to substantially restrain a child, the child having upper legs, in a sitting position when connected to a child transport, comprising:

a first strap having a first and second end;

a second strap having a first and second end;

a first pivot capable of being secured to a child transport between the upper legs of a child seated therein;

wherein:

the first end of the first strap and the first end of the second strap are securely connected to the first pivot; and

the second end of the first strap and the second end of the second strap are each adjustably connected to a fastener;

a third strap having a first and second end;

a fourth strap having a first and second end;

a second pivot capable of being secured to a child transport behind a child seated therein;

wherein:

the first end of the third strap and the first end of the fourth strap are securely connected to the second pivot;

the second end of the third strap and the second end of the fourth strap are each adjustably connected to a fastener;

the adjustably connected fastener on the third strap is detachably connected with the adjustably connected fastener on the first strap, such that the third strap and the first strap pass over the shoulder region of a child restrained therein; and

the adjustably connected fastener on the fourth strap is detachably connected with the adjustably connected fastener on the second strap, such that the fourth strap and the second strap pass over the shoulder region of a child restrained therein;

a fifth strap having a first and second end;

a sixth strap having a first and second end;

wherein:

the first end of the fifth strap is fixably connected to the first strap and the first end of the sixth strap is fixably connected to the second strap;

the second end of the fifth strap and the second end of the sixth strap are each adjustably connected to a fastener;

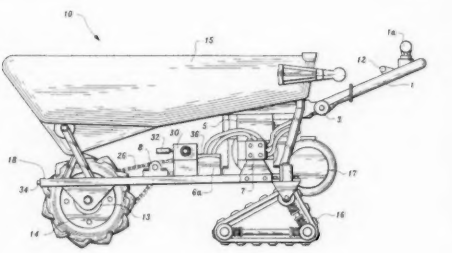
the adjustably connected fastener on the fifth strap is detachably connected with the adjustably connected fastener on the sixth strap; and

the fifth strap and sixth strap, when connected to one another, are transversely positioned between the first strap and the second strap, across the back of an child restrained therein;

a seventh strap slidably connected to the first and second strap;

wherein the seventh strap is positioned transversely between the first and second straps across the chest region of a child restrained therein.

US 6,409,273 B1
TRACKED MOTORIZED CARRIER WITH ACCESSORY ATTACHMENT DRIVE
Jeffery D. Campbell, 2686 N. Argyle St., #101, Fresno, Calif. 93927
Filed Jun. 18, 2001, Appl. No. 884,819
Int. Cl. B62D *51/04*
U.S. Cl. 298—2 **3 Claims**



1. A tracked carrier with an accessory attachment valve, comprising:

a frame;

a handle secured to said frame, said handle having a proximal and a distal end thereto and a pair of downwardly depending support elements; said handle having means for controlling brakes mounted thereon;

a first wheel secured to the distal end of said handle by frame elements;

a pair of drive tracks secured to the proximal end of the handle by frame elements;

a drive engine operably mounted on said frame and communicatively linked to said pair of drive tracks by a drive mechanism;

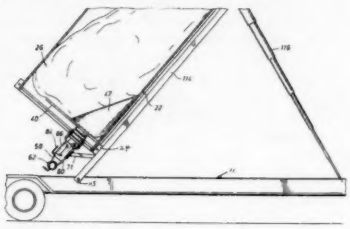
a hydraulic pump linked to a hydraulic drive motor, said hydraulic pump being operably linked to a pair of drive tracks arm levers;

a throttle mechanism being operably engaged to said drive engine;

a hydraulic attachment lever valve secured to said frame; and

a secondary hydraulic pump operably linked to said hydraulic attachment lever valve.

US 6,409,274 B1
APPARATUS AND METHOD FOR UNLOADING PARTICULATE MATERIAL FROM CONTAINERS
Ronald G. Merrett, Harris County, Tex., assignor to Intermodal Container Systems, Houston, Tex.
Filed Jul. 31, 2000, Appl. No. 629,753
Int. Cl. B60P *1/04*
U.S. Cl. 298—17 R **8 Claims**

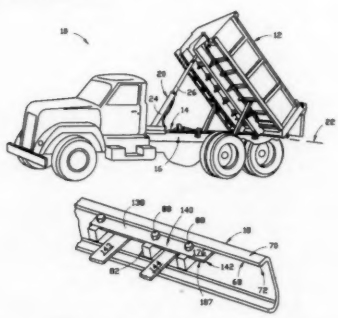


1. Apparatus for the gravity unloading of particulate material from a sealed plastic bag in a container mounted on a highway trailer upon tilting of the container a desired amount, the rear end of the container having a rear bulkhead for supporting the plastic bag; said apparatus comprising:

a connecting fitting for mounting on said bulkhead and for extending therethrough;

a vacuum unloading device detachably connected to said fitting, said vacuum unloading device including a pair of substantially rigid tubular conduits secured to each other at a desired angle and in fluid communication with each other, one of said tubular conduits being a lading conduit for receiving particulate material from the container, the other tubular conduit being a pneumatic conduit extending in a horizontal direction transversely of the longitudinal axis of said trailer and connected to a pressurized pneumatic source for exerting a vacuum on said one tubular conduit to draw the particulate material therefrom for conveyance along said other conduit, and a manually operated flow control member on said one tubular conduit to control the flow of particulate material from said container to said other conduit.

US 6,409,275 B1
FRAME ATTACHMENT FOR VEHICLE
Ronald B. Gerding, Florence, Ala., assignor to The Heil Company, Chattanooga, Tenn.
Filed May 2, 2000, Appl. No. 563,418
Int. Cl. B60P *1/16*
U.S. Cl. 298—22 R **15 Claims**



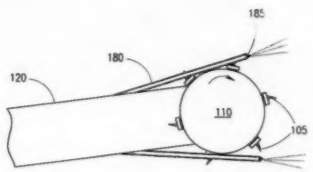
1. An assembly for mounting an accessory to the chassis of a vehicle having a long axis, which chassis includes a first longitudinal frame component and a second longitudinal frame component, which frame components are disposed along the long axis of the vehicle in a substantially parallel relationship to each other, with each of said frame components including a substantially horizontal portion having an upper surface and an oppositely disposed lower surface, which assembly comprises:

(a) an accessory mounting frame comprising a first base plate and a second base plate, said first base plate having an inwardly extending part that extends beyond the horizontal portion of the first frame component, and said second base plate having an inwardly extending part that extends beyond the horizontal portion of the second frame component;

(b) means for clamping the first base plate to the horizontal portion of the first frame component;

(c) means for clamping the second base plate to the horizontal portion of the second frame component.

US 6,409,276 B1
WATER-JET ASSISTED DRUM-TYPE MINING SYSTEM
Donald B. Sult, Charlottesville, and Jeffrey J. Schwoebel, Free Union, both of Va., assignors to Amvest Systems, Inc., Charlottesville, Va.
Provisional application No. 60/127,515, filed on Apr. 2, 1999. This application Mar. 31, 2000, Appl. No. 540,044.
Int. Cl. E21C *25/60*
U.S. Cl. 299—17 **24 Claims**



1. A water jet assisted drum-type miner for mining coal or other mineral deposits comprising:

a transversely mounted drum having a plurality of mechanical cutting bits mounted on an exterior surface of said drum;

at least one motor providing mechanical power to rotate said drum to cut said mineral deposits;

at least one conduit for supplying a high pressure fluid to a plurality of nozzles; and

said plurality of nozzles each directing a high pressure jet of fluid to cut said deposits independently of said mechanical cutting bits, wherein said at least one conduit is an externally mounted tube located above or below said drum.

US 6,409,277 B2
VEHICLE WHEEL COVER
Mitchell Nunes, 8820 Maislin Dr., Tampa, Fla. 33637, and Calvin Wang, 768 S. Turnbull Canyon Rd., Industry, Calif. 91745
Division of application No. 09/464,266, filed on Dec. 17, 1999. This application Jun. 6, 2001, Appl. No. 874,020.
Int. Cl. B60B *7/00*
U.S. Cl. 301—37.34 **6 Claims**

1. A process for producing an enhanced finish vehicle wheel cover, said process comprising the following steps:

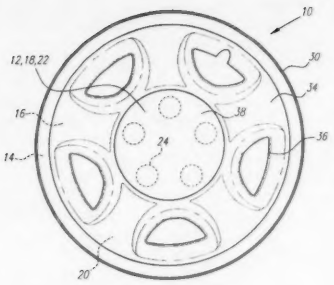
a) select a vehicle wheel constructed of common grade material having a peripheral edge, spaced lug nuts and an intrinsic design,

b) produce a replica of the exterior surface of said vehicle wheel,

c) place said replica against the exterior surface of said vehicle wheel and make any modifications and adjustments to assure a close interface with said vehicle wheel,

d) produce a mold patterned after said modified and adjusted vehicle wheel replica,

e) produce from said mold a thin-walled plastic vehicle wheel cover having an exterior surface, an interior surface and a



peripheral edge, wherein the exterior surface has a design which replicates the intrinsic design of said vehicle wheel,

f) apply an enhanced finish, such as chrome plating to said plastic wheel cover,

g) inspect the selected finish wheel cover for general appearance, fit, valve stem clearance, and quality of the chrome plating,

h) attach a plurality of vehicle wheel attachment means spaced around the interior surface and adjacent the peripheral edge of said vehicle wheel cover, and

i) attach a set of wheel covers to a set of vehicle wheels by pressing the attachment means against the peripheral edges of said vehicle wheels, wherein when attached, the vehicle wheels simulate the appearance of solid, chrome-plated vehicle wheels.

US 6,409,278 B1

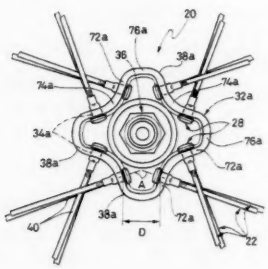
SPOKE NIPPLE FOR BICYCLE WHEEL

Masao Nakajima, Osaka, Japan, assignor to Shimano Inc., Osaka, Japan

Filed Feb. 2, 2000, Appl. No. 495,941

Int. Cl. B60B *27/00*

U.S. Cl. 301—59 **20 Claims**



1. A spoked hub assembly comprising:

a hub having a body portion and a first tubular mounting portion coupled to a first end of said body portion, said first tubular mounting portion being formed by four spoke attachment projections coupled together in a circumferentially spaced arrangement, each of said spoke attachment projections being formed of a pair of circumferentially spaced attachment sections connected to each other by an outer connecting section to form a spoke nipple receiving recess therebetween, each pair of said spoke attachment sections of each of said spoke attachment projections being angled to converge at a point radially outwardly of said connecting section to form an acute angle therebetween, each of said spoke attachment sections having a spoke attachment opening formed therein, each pair of said spoke attachment openings of each of said spoke attachment projections being arranged to form a limited axial space less than about twenty millimeters between each pair of said spoke attachment openings of each of said spoke attachment projections;

a plurality of spoke nipples arranged in said spoke attachment openings, each spoke nipple including a head portion arranged on said first side of one of said spoke attachment openings and a shaft portion extending axially from said head portion through one of said spoke attachment openings, said head portion having an end surface with a hexagonal bore formed therein and a first predetermined width, said shaft portion having an axial bore with internal threads and a second maximum predetermined width that is smaller than said first predetermined width of said head portion, each of said hexagonal bores having a depth configured to be angularly engageable with a ball-hexagon wrench to rotate said spoke nipples within said spoke attachment openings during assembly; and

a plurality of outwardly extending spokes with each of said spokes having an inner threaded end portion, an outer end portion, and a center portion located between said inner and outer end portions, each of said inner threaded end portions being coupled to one of said spoke nipples such that each pair of said spokes coupled to each of said spoke attachment projections diverge from each other to form an obtuse angle therebetween, each of said outer end portions of said spokes having an enlarged head member adapted to be retained by a rim.

US 6,409,279 B1

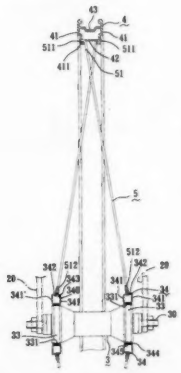
BICYCLE WHEEL WITH A HUB PROVIDED WITH MOUNTING SEATS FOR MOUNTING SPOKES THEREON

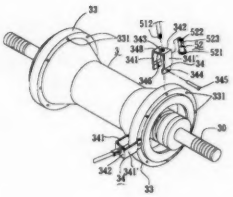
Chao-Ying Chen, Tainan Hsien, Taiwan, assignor to Alex Machine Industrial Co., LTD, Tainan Hsien, Taiwan

Filed Aug. 6, 2001, Appl. No. 923,129

Int. Cl. B60B *1/02;21/06;1/06;3/00*

U.S. Cl. 301—59 **5 Claims**





1. A bicycle wheel for installation on a wheel axle having an axis said bicycle wheel comprising:

a hub for mounting rotatably on the wheel axle, said hub having left and right end portions which are opposite to each other along an axis of the wheel axle, said left and right end portions being formed with respective annular mounting flanges which surround the axis of the wheel axle;

a plurality of mounting seats arranged around the axis of the wheel axle and mounted pivotally on said mounting flanges of said hub;

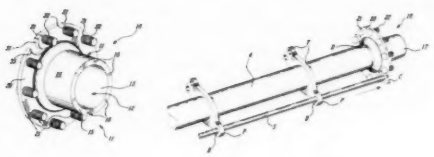
a wheel rim disposed around said hub and said mounting seats, said wheel rim including an annular tire retaining portion and an annular spoke mounting portion which extends radially and inwardly from said tire retaining portion; and

a plurality of spokes having outer ends mounted on said spoke mounting portion of said wheel rim, and inner ends mounted on said mounting seats for mounting said wheel rim on said hub,

wherein said mounting seats are pivoted to said mounting flanges of said hub so as to be pivotable about pivot axes that are parallel to the axis of the wheel axle, and

wherein each of said mounting flanges of said hub has a plurality of pivot holes formed therethrough, said pivot holes having axes parallel to the axis of the wheel axle and being arranged around and angularly spaced apart relative to the axis of the wheel axle, each of said mounting seats including first and second side walls respectively disposed on opposite left and right sides of a corresponding one of said mounting flanges and which are formed with aligned through holes that are aligned with a respective one of said pivot holes in the corresponding one of said mounting flanges, each of said mounting seats further including at least one mounting wall interconnecting said side walls and formed with a mounting hole for mounting said inner end of a respective one of said spokes, and pivot shaft extending through said through holes and the respective one of said pivot holes.

US 6,409,280 B1
TRUCK AND TRAILER HUB
Douglas Mair, 7785 Cote de Liesse, St-Laurent, Quebec, Canada, H4T 1G3
Provisional application No. 60/239,034, filed on Oct. 10, 2000. This application May 14, 2001, Appl. No. 853,764.
Int. Cl. B60B *27/00;35/00;* **F16D** *65/14;* **B61H** *13/36*
U.S. Cl. 301—105.1 **6 Claims**



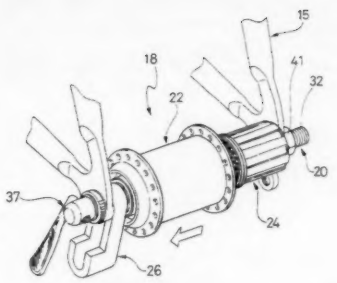
1. A hub for at least one of a truck or trailer of the type having a generally cylindrical portion defining an aperture, whereby said hub is adapted for mounting on a spindle of an axle such as to be free to rotate on the spindle, said hub having a flange projecting outwardly from an outer surface of said cylindrical portion, said flange comprising a plurality of throughbores therein, whereby the flange is adapted for securing a wheel and brake drum assembly thereto, such that the wheel and brake drum assembly can rotate with said hub and brake therewith when a brake member of the axle is actuated on a portion of the wheel and brake drum assembly by a cam shaft; said flange having at least a notch therein such that the cam shaft may be removed by pulling it through said notch without said hub requiring to be removed from the spindle.

US 6,409,281 B1
BICYCLE HUB WITH SPACER AND DETACHABLE FREEWHEEL
Takanori Kanehisa, and Masahiro Yamanaka, both of Osaka, Japan, assignors to Shimano Inc., Osaka, Japan
Filed Dec. 4, 2000, Appl. No. 728,086
Int. Cl. B60B *27/00*
U.S. Cl. 301—110.5 **29 Claims**

1. A bicycle hub comprising:

a hub axle having a first portion and a second portion releasably coupled to said first portion;

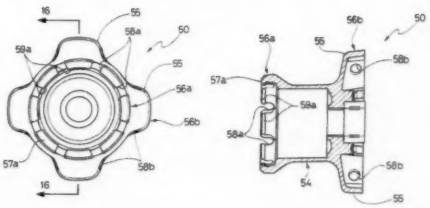
a hub body having an outer tubular portion and an interior passageway with said first portion of said hub axle being rotatably supported therein;



a sprocket support member releasably and non-rotatably coupled to said outer tubular portion of said hub body, said sprocket support member being mounted on said second portion of said hub axle; and

a spacer supported on said first portion of said hub axle adjacent a free end of said hub body, said spacer having a spacing portion and being configured to move in a transverse direction relative to said hub axle between a first position in which said spacing portion is located adjacent said hub axle and a second position in which said spacing portion is spaced from said hub axle without removing said first portion of said hub axle from said hub body.

US 6,409,282 B1
BICYCLE HUB
Masao Nakajima, and Takashi Ohtsuji, both of Sakai, Japan, assignors to Shimano Inc., Osaka, Japan
Division of application No. 09/528,190, filed on Mar. 17, 2000. This application Nov. 30, 2001, Appl. No. 996,961.
Int. Cl. B60B *27/00*
U.S. Cl. 301—110.5 **21 Claims**



1. A bicycle hub for use with bicycle spoke nipples, said bicycle hub comprising:

a hub axle having a center axis extending between a first end and a second end;

a hub body having

a tubular center portion defining an interior passageway with said hub axle being rotatably supported therein,

a first mounting portion coupled to a first end of said center portion, said first mounting portion having a plurality of first spoke openings extending axially to a first free edge of said first mounting portion and a plurality of first protrusions fixedly coupled to said first mounting portion and extending radially inwardly from said first mounting portion adjacent said first spoke openings to maintain the spoke nipples in said first spoke openings, said first mounting portion being configured to mount a first set of radial spokes thereto, and

a second mounting portion coupled to a second end of said center portion, said second mounting portion having a plurality of second spoke openings formed therein, said second mounting portion including a plurality of radially extending attachment projections having said second spoke

openings formed therein, said second mounting portion being configured to mount a second set of tangential spokes thereto; and

a freewheel portion coupled to said hub body adjacent said second mounting portion of said hub body.

US 6,409,283 B1

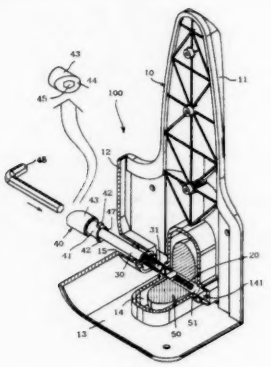
WHEEL ASSEMBLY FOR A TRUCK-ATTACHED CARRIAGE

Yung-Shun Hsieh, No. 15, Lane 493, Sec. 2, Yuan-Chi Rd Yuanlin, Chang-Hua Hsien, Taiwan

Filed Mar. 2, 2001, Appl. No. 798,443

Int. Cl. B60B *19/00*

U.S. Cl. 301—111.05 **9 Claims**



1. A wheel assembly for a trunk-attached carriage that usually includes two wheels, comprising:

an integrally formed wheel bracket having a vertical plate, a side plate and a bottom plate respectively corresponding to a back surface, a side surface, and a bottom surface of a trunk for fitly mounting onto a lower rear corner of said trunk by means of screws or rivets;

a compression spring;

a wheel axle extended across said wheel bracket at a predetermined position and having a first end provided with an axial cavity for receiving a first end of said compression spring therein;

a locking member having a first end that has an expanded outer diameter to provide a cylindrical knob that is accessible from outside of said wheel bracket, and a second end that has a reduced outer diameter compared with said first end to provide a cylindrical locking body, and said locking body being provided with an axially extended central fixing hole for receiving a second end of said wheel axle; and

a wheel rotatably mounted on said wheel axle in said wheel bracket; and

said wheel assembly being able to the easily assembled and dis-assembled for the purpose of replacement of any damaged components thereof, so that said wheel assembly and said trunk-attached carriage could be produced at reduced cost and high productivity and has prolonged useable life.

US 6,409,284 B1

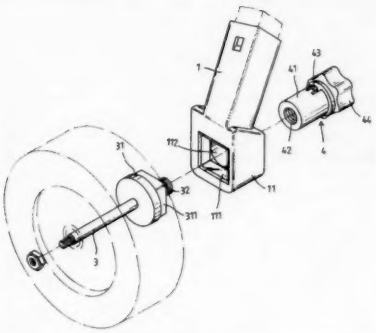
CONNECTING STRUCTURE OF A WHEEL OF A GOLF CARRIER

Chin Sung Ko, No. 38, Din Nan Road, Ho Mei, Changhau, Taiwan

Filed Jun. 25, 2001, Appl. No. 887,356

Int. Cl. B60B *23/00*

U.S. Cl. 301—111.06 **1 Claim**



1. A connecting structure of a wheel of a golf carrier relating to a connecting structure between a wheel and a connecting link of a golf carrier, wherein the connecting link being provided with an end receiver which has a rectangular groove at one side, a neck at the other side, and an inner circular hole, and a shaft of the wheel being provided with an inner connecting portion which has a rectangular protrusion for adapting the groove of the receiver to obtain a firm engagement, and an outward thread end being extended into the circular hole; a fixing bolt being provided to insert into the neck to engage an inner bolt hole of a bolt rod of the bolt with the thread. end, and while a bolt head of the bolt is rotated, the receiver and the shaft being connected firmly; and an elastic flange being formed on the bolt rod and when the flange passes through the neck of the receiver, the bolt being securely engaged with the receiver and never being loosened or released from the receiver.

US 6,409,285 B1

FRONT WHEEL AND REAR WHEEL INTERLOCKING BRAKE SYSTEM FOR MOTORCYCLE

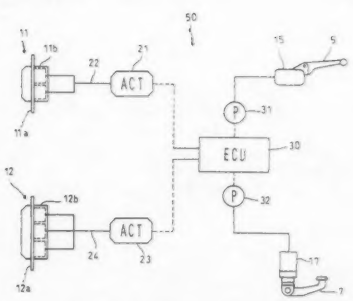
Takeshi Wakabayashi, and Kazuhiko Tani, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 2000, Appl. No. 527,673

Claims priority, application Japan, Mar. 17, 1999, 11-072268

Int. Cl. B60T *13/00*

U.S. Cl. 303—9.64 **8 Claims**



1. A front wheel and rear wheel interlocking brake system for a motorcycle in which a front wheel brake and a rear wheel brake,

each being hydraulically operated, are provided on a front wheel and a rear wheel, respectively, said brake system comprising:

a front wheel side actuator for applying a hydraulic pressure to said front wheel brake;

a rear wheel side actuator for applying a hydraulic pressure to said rear wheel brake;

a first and second brake operating means operated by a driver;

an operated amount detecting means for detecting an operated amount of said brake operating means; and

a control means for receiving and calculating an operated amount detected by said operated amount detecting means, and outputting drive control signals to said front wheel side actuator and said rear wheel side actuator on the basis of the calculated result,

wherein said control means receives running state information other than said operated amount detected by said operated amount detecting means, and performs brake control for single brake control for singly driving either said front wheel brake or said rear, wheel brake and interlocking brake control for driving said front and rear wheel brakes in accordance with a specific braking force distribution characteristic, and causes control to switch between single brake control and interlocking brake control on the basis of said running state information, and

wherein said control means also performs brake control in such a manner that when either of said first and second brake operating means is operated, said single brake control is performed until said detected operated amount reaches a specific value, and if said detected operated amount exceeds said specific value, said single brake control is switched into said interlocking brake control.

US 6,409,286 B1

METHOD AND BRAKING SYSTEM FOR REGULATING THE DRIVING STABILITY OF A MOTOR VEHICLE

Helmut Fennel, Bad Soden, Germany, assignor to Continential Teves AG & Co. OHG, Frankfurt, Germany

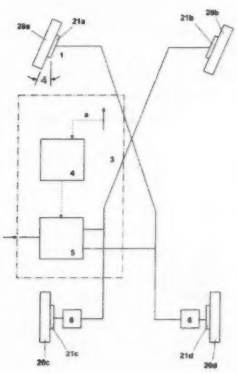
PCT No. PCT/EP98/08355, § 371 Date Sep. 27, 2000, § 102(e) Date Sep. 27, 2000, PCT Pub. No. WO99/35016, PCT Pub. Date Jul. 15, 1999

PCT Filed Dec. 21, 1998, Appl. No. 582,751

Claims priority, application Germany, Dec. 30, 1997, 197 58 074

Int. Cl. B60T *8/24*

U.S. Cl. 303—140 **12 Claims**



1. A method for controlling driving stability of an automotive vehicle, comprising the steps of:

determining a steering angle, a rotational behavior of individual wheels, a vehicle yaw velocity, a vehicle forward speed, and a coefficient of friction between tires and road;

determining an intervention threshold based on differences in the rotational behavior of individual wheels,

adjusting brake pressure by use of a hydraulic pump having a clocked actuation to vary the vehicle yaw velocity toward the intervention threshold by one of increasing or decreasing brake pressure,

whereby a clock frequency for driving the hydraulic pump is increased when the intervention threshold is exceeded.

US 6,409,287 B1

YAW CONTROLLING APPARATUS FOR AN AUTOMOBILE

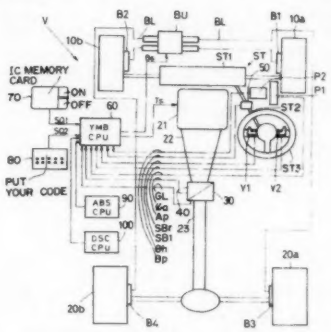
Martin Leach, Wachtberg, Germany, and Shouichi Kamimura, Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 23, 2000, Appl. No. 643,961

Claims priority, application Japan, Aug. 24, 1999, 11-236433

Int. Cl. B60T *8/60*

U.S. Cl. 303—146 **10 Claims**



1. A vehicle yaw controlling apparatus that is a vehicle brake system capable of independently controlling right and left wheels, comprising:

a pair of right and left operating switches each disposed wherein a driver can independently operate the right and left operating switches while holding a steering wheel with both hands;

a control device for applying brake force to a brake unit of one of the right and left wheels when the driver operates one of the right and left operating switches, and applies brake force to a brake unit of the other of the right and left wheels when the driver operates the other of the right and left operating switches; and

a control prohibiting means for prohibiting operation by the control device under a specific condition;

wherein the control prohibiting means is a driver identification means for permitting use only by a particular driver.

US 6,409,288 B2

BRAKING FORCE CONTROLLING APPARATUS

Hiroaki Yoshida, Mishima, and Satoshi Shimizu, Susono, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP97/01435, § 371 Date Oct. 21, 1998, § 102(e) Date Oct. 21, 1998, PCT Pub. No. WO97/41018, PCT Pub. Date Nov. 6, 1997

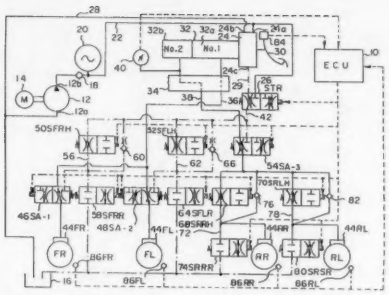
PCT Filed Apr. 24, 1997, Appl. No. 171,589

Claims priority, application Japan, Apr. 26, 1996, 8-108180

Int. Cl. B60T *13/66*

U.S. Cl. 303—155 **10 Claims**

1. A braking force controlling apparatus which selectively performs one of a normal control to generate a braking force by a braking operation and a brake-assisting control to generate an



increased braking force larger than the braking force generating during the normal control, said apparatus comprising:

an operation quantity detection means for detecting a quantity of operation of a brake pedal;

a maximum operation quantity storage means for storing a value representative of a maximum quantity of operation of the brake pedal detected by the operation quantity detection means; and

a brake-assisting control termination judgment means for determining, based on a result of comparison of the operation quantity detected by the operation quantity detection means and the value representative of the maximum quantity stored by the maximum operation quantity storage means, whether the brake-assisting control should be terminated.

US 6,409,289 B2

METHOD AND DEVICE FOR ENSURING THE BRAKING EFFECT OF BRAKE ACTUATORS IN A VEHICLE

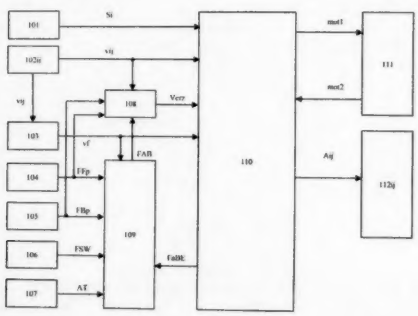
Jochen Wagner, Moeglingen, and Stefan Rychlak, Ilsede, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed May 29, 2001, Appl. No. 867,119

Claims priority, application Germany, May 29, 2000, 100 264 01; Oct. 27, 2000, 100 533 33

Int. Cl. B60T *17/22;8/00;8/92*

U.S. Cl. 303—191 **15 Claims**



1. A method of ensuring a braking effect of brake actuators arranged in a vehicle, each brake actuator including at least one first component and second components for producing the braking effect, the method comprising:

removing films on the at least one first component which would interfere with the braking effect;

determining whether an acitivation condition is met, taking into account a quantity describing an operation of an accelerator pedal; and

if the activation condition is met:

activating the brake actuators to remove the films; and

applying the second components to the at least one first component to enable a vehicle deceleration to be set so that a driver perceives at most little deceleration.

US 6,409,290 B1

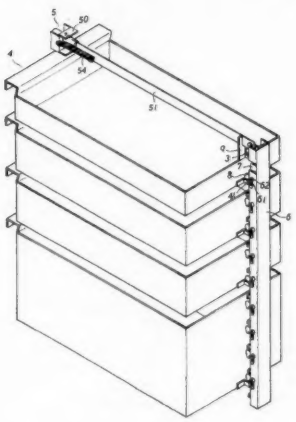
DRAWER FASTENING DEVICE

Hui-Liang Lin, Chiayi Hsien, Taiwan, assignor to San Jye Co., Ltd., Chiayi Hsien, Taiwan

Filed Feb. 12, 2001, Appl. No. 781,670

Int. Cl. E05B *65/46*

U.S. Cl. 312—219 **3 Claims**



1. A drawer fastening device disposed on a drawer having a plurality of insertion grooves, and the drawer fastening device comprising:

a lock device disposed on a top portion of the drawer, a connection plate, a slide plate, a plurality of hooking plates, a plurality of pivot pins, and a positioning frame disposed on the drawer,

the positioning frame having a plurality of slide slots and a plurality of enlarged holes,

each said slide slot communicating with one of the enlarged holes,

the slide plate having an upper end groove and a plurality of through holes,

each said hooking plate having an upper distal hook and a lower blocking bar,

each said pivot pin fastening the positioning frame, the corresponding hooking plate and the slide plate together through one of the enlarged holes of the positioning frame and one of the through holes of the slide plate,

the lock device having a positioning seat, a driven plate connected to the positioning seat, and a mount connected to the driven plate,

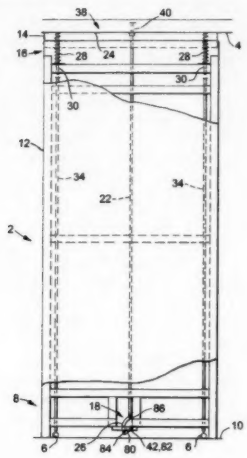
the positioning seat having a hooking portion,

the driven plate having a distal notch,

the connection plate fastened in the mount pivotally and the connection plate connected to the driven plate, and

the slide plate connected to the connection plate.

US 6,409,291 B1
FURNITURE
Victor Johnson, Surrey, United Kingdom, assignor to Panelock Systems Limited, Surrey, United Kingdom
Filed Mar. 22, 2000, Appl. No. 532,926
Int. Cl. A47B *97/00;* **E04B** *2/82*
U.S. Cl. 312—249.8 **11 Claims**



1. An article of furniture comprising a frame and wheels for supporting the furniture, the wheels being moveable between a retracted position and extended position, in the retracted position the wheels being retracted within a base portion of the furniture and in the extended position the wheels extending from the base portion to support the weight of the furniture; and an over-center locking mechanism comprising a first pivot member pivotally coupled to the frame at a first pivot axis, and a second pivot member pivotally coupled to the first pivot member at a second pivot axis, the second pivot member also being pivotally coupled to an operating member at a third pivot axis, the first and third pivot axes being located on a common longitudinal axis and when moving between unlocked and locked configurations, the second pivot axis moves through said longitudinal axis to a position spaced from said longitudinal axis, said locking mechanism being operatively coupled with the wheels, for moving the wheels between the retracted and extended positions.

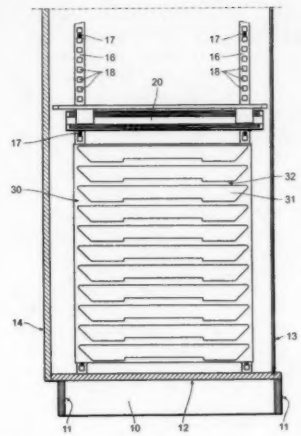
US 6,409,292 B1
STORAGE CUPBOARD, IN PARTICULAR FOR HOSPITAL REQUIREMENTS
Bernd Janowitz, Wildeshausen, Germany, assignor to JANOMED Produktions- und Vertriebs, Wildeshausen, Germany
Filed Feb. 1, 2000, Appl. No. 495,735
Claims priority, application Germany, Feb. 3, 1999, 199 04 247
Int. Cl. A47B *47/00*
U.S. Cl. 312—257.1 **6 Claims**

1. A storage cupboard for storing hospital supplies, the storage cupboard comprising:

a sidewall;

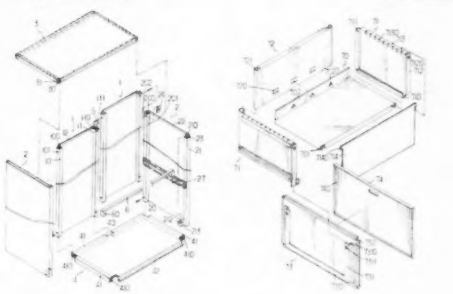
perforated rails mounted on the sidewall, each of the perforated rails defining a plurality of holes;

a support wall having oppositely disposed sides, the support wall having guides for supporting insertable containers on one side and snap-in toes on the oppositely disposed side, the snap-in toes removably inserted into the holes defined on at least one of the perforated rails, without tools or hardware thereby removably securing the support wall to the sidewall; and



a telescopic rail wherein the telescopic rail is adapted to support a drawer and has a member adapted to be received by the holes defined in the perforated rail, the telescopic rail being selectively interchangeable with at least one of the support walls.

US 6,409,293 B1
CABINET AND DRAWER ASSEMBLY STRUCTURE
Ching-Chang Chang, No. 14, Tzu-Chiang Rd., Yeh-Pu Hsiang, Ping-Tung Hsien, Taiwan
Filed Jul. 24, 2001, Appl. No. 910,727
Int. Cl. A47B *47/00;88/00*
U.S. Cl. 312—257.1 **2 Claims**



1. A cabinet and drawer assembly structure comprising a cabinet assembly having two identical rear panels juxtaposed together and fastened to two side panels at two sides and an upper panel and a lower panel, and the side panels having respectively an inner side with a slide roller channel mounted thereon for supporting a drawer assembly, wherein:

the two rear panels are identically shaped and formed, each rear panel having two first square channels located at two sides thereof which form respectively a trough therein, the first channel on the left hand side of each rear panel having an upper end and a lower end each having a screw bore formed. therein, the first channel on the right hand side of each rear panel having an upper end and a lower end each having a key hole formed therein, the key holes having a longitudinal slot for receiving and engaging with a ball screw rod to fasten the two juxtaposed rear panels, the two side panels having respectively a second rear square channel and second forward square channel located at two sides thereof which have a trough formed therein; the second rear square channel of each

side panel having screw bores formed at the upper end and lower ends thereof for fastening to the rear panels, each of the rear panels having a jut edge formed on the top end thereof to wedge in a wedge slot formed on the peripheral rims of the upper panel, the lower panel having a notch formed on a rear rim thereof to match and engage with the bottom ends of the coupled first inner channels of the rear panels;

the second forward channel of the side panels having an anchor block extended from the bottom ends thereof, each of the anchor blocks having an aperture formed therein, the apertures of the anchor blocks and the troughs of the second rear and forward square channels allowing wedge legs of a transverse beam to wedge in, the side panels having jut edges formed at the top ends thereof to wedge in the wedge slot formed on the peripheral rims of the upper panel, the second rear square channel of a right one of the side panels having screw bores formed at the upper ends and lower ends thereof for fastening to one of the first square channels of one of the rear panels through the ball screw rods in key holes at the slots, the left one of the side panels being attached to another one of the rear panels, the second rear and forward square channels of each side panel having an inner side facing each other with equally spaced wedge notches formed thereon facing wedge notches of both of the side panels engaging with snap fingers of a bracket, each of the brackets having a nose section to support a partition for forming a holding space;

the wedge slot formed on the peripheral rims of the upper panel extends downwardly for receiving the jut edges formed at the top end of the rear panels and side panels to be wedged in and coupled securely thereto;

the lower panel has the left, right and rear sides bent respectively to form a third square channel with a trough formed inside, the lower panel having notches formed at two ends of two sides thereof to wedge and couple with the side panels, the front edge of the lower panel being extended forwards to form a jutting ledge to match and contact a front panel; and

the drawer assembly includes a bottom plate, two opposing side plates, a rear plate, a front plate and a coupling frame, wherein:

the bottom plate has two rods located below two sides thereof to couple with a slide channel extended from an inner side of the bottom of the side plates, the side plates being turnable about the rod for resting on the bottom plate for folding, the bottom plate having a rear edge extended upwards to form a jutting flange which has wedge tongues extending outwards formed by punching to engage with square openings formed on the rear plate;

the side plates each having a slide channel formed on a side thereof in addition to the slide channel formed on the bottom thereof, each of the slide channels on the sides being slidably engageable with a rod located on one of the side edges of the rear plate, a forward side of the side plates forming a coupling plate extended outwards, each of the coupling plates having a wedge lug proximate to the top end thereof formed by punching, the front plate having a U-shaped frame attached thereon with two troughs formed at two sides for receiving the coupling plates, the frame having a plank bordering the trough and having square wedge apertures matching and engaging with the wedge lugs, the side plates each having an extended ledge formed on the top end thereof which have a plurality of anchor slots for holding latch lugs located at two sides of a top end of separators;

the square openings of the rear plate are proximate the bottom thereof; and

the front plate having a ⊓shaped wedge plate extended from two sides thereof to couple with indented recesses formed on the inner rim of the coupling frame;

whereby the drawer assembly is accomplished by coupling the two side plates with the bottom plate by sliding the rods into the slide channels, then turning the side plates inwards and resting the side plates flatly on the bottom plate, then stacking the rear plate, the front plate and the coupling frame, and transporting to a users' site, turning the two opposing side plates to positions desired, wedging the rods at two sides of the rear plate into the side slide channels of the side plates, and engaging the square openings of the rear plate with the wedge tongues of the bottom plate, and wedging the coupling plates of the side plates into the troughs at two sides of the U-shaped frame attached to the inner side of the front plate with the coupling frame coupled thereon; and

then juxtaposing and assembling the two rear panels of the cabinet, fastening the two side panels and the upper panel and the lower panel through the ball screw rods, and wedging and fastening respectively the upper end and lower end of the front side and the rear side of the top section of the rear panels and side panels with the transverse beam, then fastening the upper panel and the lower panel to complete the cabinet and drawer assembly.

US 6,409,294 B1

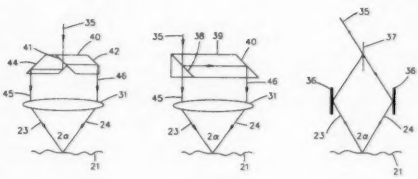
DIGITAL POSTAGE FRANKING WITH COHERENT LIGHT VELOCIMETRY

Eric Zimmermann, La Neuveville, and Christian Moy, Grossaffoltern, both of Switzerland, assignors to Ascom Hasler Mailing Systems AG, Bern, Switzerland

Continuation of application No. 09/023,457, filed on Feb. 13, 1998, Provisional application No. 60/068,434, filed on Dec. 22, 1997. This application May 18, 2000, Appl. No. 573,646.

Int. Cl. B41J *3/00*

U.S. Cl. 347—2 **20 Claims**



1. A postage meter comprising a digital print head and a velocity sensor having an output, said postage meter having a bed defining a paper path with a direction, said digital print head and said velocity sensor positioned along said paper path; said velocity sensor comprising a light source and a light sensor, said light source comprising first and second monochromatic collimated beams, said first beam impinging upon said paper path at a first angle leading said direction and defining a sensing area, said second beam impinging upon said sensing area at said first angle lagging said direction, said first and second beams yielding a diffraction pattern within said sensing area; said light sensor sensing light intensity at a region within said sensing area, said velocity sensor further comprising a frequency detector responsive to said sensed light intensity yielding a signal indicative of the measured frequency, said signal comprising the output of the velocity sensor; said print head operatively coupled with said velocity sensor output.

US 6,409,295 B1

INK-JET DEVICE

Takashi Norigoe, Shizuoka-ken, Japan, assignor to Toshiba Tec Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1999, Appl. No. 239,434

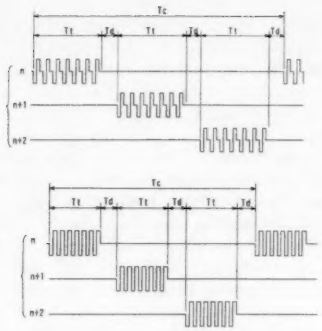
Claims priority, application Japan, Feb. 2, 1998, 10-020675

Int. Cl. B41J *29/38;2/205*

U.S. Cl. 347—11 **3 Claims**

1. An ink-jet device comprising:

a print head having an ink chamber which stores ink to be ejected therefrom and an electrostrictive member which



deforms the ink chamber to increase a pressure of said ink chamber to eject the ink; and

a drive unit which drives said print head such that said ink is ejected as one or more ink drops in a multi-tone print mode and as a single ink drop in a monotone print mode;

wherein said drive unit includes a pulse generator which: (i) supplies a variable number of drive pulses to said print head in a first cycle so as to cause the ink chamber to successively eject a number of ink drops equal to the variable number of drive pulses in the multi-tone print mode, and (ii) supplies a fixed number of drive pulses to said print head in a second cycle shorter than the first cycle so as to cause the pressure of said ink chamber to be gradually increased to finally eject the single ink drop in the monotone print mode; and

wherein an amplitude of the drive pulses is constant between the multi-tone print mode and the monotone print mode.

US 6,409,296 B1

LIQUID DISCHARGE METHOD, LIQUID DISCHARGE HEAD AND LIQUID DISCHARGE APPARATUS

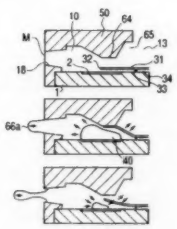
Yoshinori Misumi; Hiroyuki Ishinaga, both of Tokyo; Yoichi Taneya, Yokohama; Hiroyuki Sugiyama, Sagamihara, and Satoshi Shimazu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 2000, Appl. No. 624,380

Claims priority, application Japan, Jul. 27, 1999, 11-212904

Int. Cl. B41J *29/38;2/05*

U.S. Cl. 347—11 **27 Claims**



1. A liquid discharge head comprising:

a heat generating member for generating thermal energy for generating a bubble in liquid;

a discharge port constituting a portion for discharging the liquid;

a liquid flow path communicating with said discharge port and including a bubble generating area for generating the bubble in the liquid;

a movable member provided in said liquid flow path and adapted to displace according to the growth of the bubble; and

a limiting portion for limiting the displacement of said movable member within a desired range,

wherein said liquid discharge head discharges the liquid from said discharge port by energy produced by generation of the bubble, thereby forming a liquid droplet, and causes the liquid droplet to land on a recording medium thereby executing recording,

and wherein plural liquid droplets are discharged in a consecutive manner from a same discharge port which are united to form the liquid droplet prior to landing on the recording medium.

US 6,409,297 B1

ALIGNMENT OF IMPRINTS

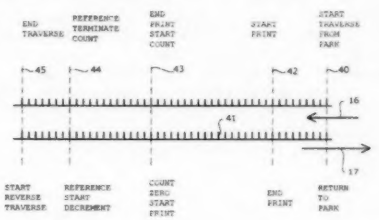
Christopher John Morgan, Stapleford; Ian Thompson-Bell, Bluntisham, and William James Herring, Brentwood, all of United Kingdom, assignors to Neopost Limited, Essex, United Kingdom

Filed Jan. 28, 2000, Appl. No. 493,669

Claims priority, application United Kingdom, Jan. 29, 1999, 9902058

Int. Cl. B41J *29/38;3/00*

U.S. Cl. 347—12 **9 Claims**



1. A method of relative alignment of a first imprint printed in a first traverse in a first direction along a first track by a print head and a second imprint printed in a second traverse in a second direction opposite to said first direction along a second track displaced relative to said first track; said print head including a plurality of selectively energisable printing elements disposed in a line; includes the steps of generating signals corresponding to increments of traverse of the print head; during the first traverse of the print head initiating printing of a first imprint; upon completion of printing said first imprint initiating stepping of a counter from a first count by said signals; terminating stepping of the counter in response to sensing of the print head passing a reference position in said first traverse; and during the second traverse of the print head initiating stepping of the counter by said signals in response to sensing of the print head passing the reference position in said second traverse; and in response to stepping of the counter to a second predetermined count initiating printing of the second imprint.

US 6,409,298 B1

SYSTEM AND METHOD FOR CONTROLLING CURRENT DENSITY IN THERMAL PRINTHEADS

Adam Jude Ahne; Mark Joseph Edwards, and John Thomas Writt, all of Lexington, Ky., assignors to Lexmark International, Inc., Lexington, Ky.

Filed May 31, 2000, Appl. No. 583,687

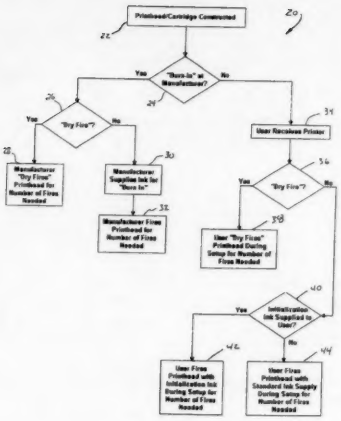
Int. Cl. B41J *29/38;29/393*

U.S. Cl. 347—14 **29 Claims**

1. A method for limiting electromigration within heater resistors of a printhead of an ink jet printer, the method comprising the steps of:

determining a resistance drop off characteristic of the printhead heater resistors;

identifying a substantially stable resistance value of the printhead heater resistors based upon the resistance drop off characteristic;



running the printhead through a resistor burn in operation which involves repeatedly firing a multiplicity of the heater resistors until a resistance value of each heater resistor of said multiplicity drops to the substantially stable resistance value; and

adjusting a voltage drop across the heater resistors in subsequent printing operations based upon the identified substantially stable resistance value in order to limit current density through the heater resistors to a level which is less than a current density level which causes undesired electromigration.

US 6,409,299 B1

PRINTING APPARATUS AND PRINTING METHOD

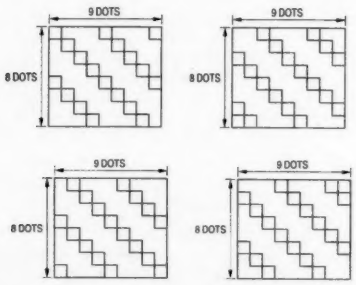
Yoshihiko Aihara, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1998, Appl. No. 218,093

Claims priority, application Japan, Dec. 25, 1997, 9-358297; Dec. 11, 1998, 10-352451

Int. Cl. B41J *2/205*

U.S. Cl. 347—15 **19 Claims**



1. A printing apparatus for printing an image on a print medium using a pattern used for representing half tone, comprising:

a printhead having a plurality of printing elements; and

print control means for scanning a different printing element in the plurality of printing elements of said printhead on the same area of the print medium plural times and performing complementary printing using the pattern used for representing half tone and a mask pattern by the plural times of scans of said printhead;

wherein the relationship between a period of a matrix of the pattern used for representing half tone and that of a matrix of the mask pattern is relatively prime.

US 6,409,300 B2

PRINTING HEAD, PRINTING METHOD AND APPARATUS USING SAME, AND APPARATUS AND METHOD FOR CORRECTING SAID PRINTING HEAD

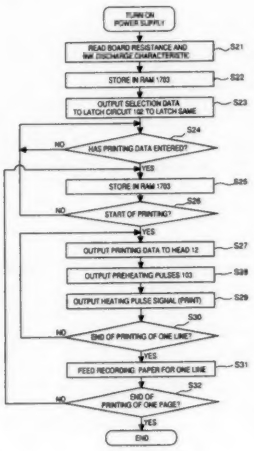
Yoshiyuki Imanaka, Yokohama; Masaki Inaba, Kawasaki; Masami Ikeda; Yutaka Koizumi, both of Yokohama; Tsuyoshi Orikasa, Musashimurayama; Tatsuo Furukawa, Isehara; Toshio Kashino, Chigasaki; Hideaki Kishida, Kawasaki; Seiichiro Karita, Yokohama; Shuji Koyama, Kawasaki; Haruhiko Terai; Kimiyuki Hayasaki, both of Yokohama; Shuichi Katao, Atsugi; Akira Goto, Yohohama; Kouichi Omata, Kawasaki; Hiroyuki Maru, Atsugi; Masaaki Izumida, Kawasaki; Yuji Kamiyama, Fujisawa, and Takayuki Ono, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of application No. 08/397,352, filed on Mar. 2, 1995, now Pat. No. 6,116,714. This application Jun. 16, 1999, Appl. No. 334,175.

Claims priority, application Japan, Mar. 4, 1994, 6-034558; Mar. 7, 1994, 6-035607; Mar. 23, 1994, 6-051711

Int. Cl. B41J *2/01*

U.S. Cl. 347—19 **16 Claims**



1. A printing-head correction apparatus for creating correction data which corrects characteristics of printing elements of a printing head, comprising:

head driving means for driving each of said printing elements of said printing head based upon prescribed image data, to print a prescribed image on a printing medium;

detecting means for detecting a variance in density of dots in the prescribed image that have been printed on the printing medium by using said printing head;

correction data generating means for generating correction data for correcting the variance in density detected by said detecting means, wherein the correction data is used to select a type of heat pulse among a plurality of types of heat pulses supplied from outside of said printing head, to supply to each of said printing elements of said printing head; and

transmitting means for transmitting the correction data to a memory of said printing head so that the correction data stored in said memory is used upon driving said printing head.

US 6,409,301 B1

INK-JET IMAGE FORMING DEVICE

Yutaka Takata; Yuichi Sugiyama, and Michitaka Fukuda, all of Tokyo, Japan, assignors to Copyer Co., Ltd., Tokyo, Japan

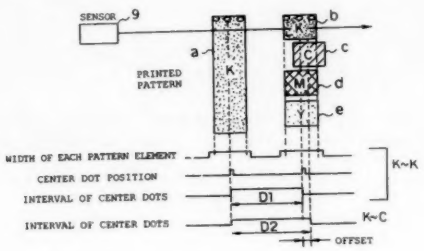
PCT No. PCT/JP99/00384, § 371 Date Sep. 28, 1999, § 102(e) Date Sep. 28, 1999, PCT Pub. No. WO99/38693, PCT Pub. Date Aug. 5, 1999

PCT Filed Jan. 29, 1999, Appl. No. 402,141

Claims priority, application Japan, Jan. 30, 1998, 10-034122

Int. Cl. B41J *29/393*

U.S. Cl. 347—19 **4 Claims**



1. In an ink-jet image forming device in which a plurality of heads are scanned in a direction substantially perpendicular to a recording-medium traveling direction, said ink-jet image forming device, comprising:

a test pattern printing means for printing a test pattern on a recording medium by using said plurality of heads;

a light-reflection type optical sensor which is scanned across the test pattern printed on said recording medium for sequentially detecting pattern elements thereof;

a binarizing circuit for binarizing an output of said light-reflection type optical sensor;

a calculating circuit for obtaining a plurality of data items concerning intervals between a reference head of said plurality of heads and the other heads, on the basis of the output of said binarizing circuit; and

means for determining amounts of offsets in print position of said other heads relative to said reference head;

said test pattern including a reference pattern element printed with said reference head, and a plurality of comparative pattern elements respectively printed with said plurality of heads at positions a constant designated interval away from said reference pattern element; and

said calculating circuit obtaining an interval data item of one of said other heads relative to said reference head, based on the output of said optical sensor in a single scan across said test pattern,

wherein said calculating circuit includes:

a rising edge detector responsive to the output of binarizing circuit for generating a pulse when detecting a rising edge thereof;

a falling edge detector responsive to the output of said binarizing circuit for generating a pulse when detecting a falling edge thereof;

a first counter for starting clock counting in response to a detected output of said rising edge detector;

a register for holding a count value of said first counter in response to said pulse of said falling edge detector;

a divider for halving the value held in said register;

a first comparator for comparing the count value of said first counter with a predetermined set value so as to stop the counting operation of said first counter when both the values coincide with each other;

a second counter for starting clock counting in response to the coincident output of said first comparator;

a second comparator for comparing the count value of said second counter with the output of said divider so as to stop the counting operation of said second counter when both the values coincide; and

a third counter for starting clock counting in response to the coincident output of said second comparator;

said third counter stopping the clock counting in response to another coincident output of said second comparator which occurs again after starting said clock counting, the count of said third counter being used as said interval data item between said reference pattern element and said comparative pattern element.

US 6,409,302 B2

SENSING SYSTEM FOR DETECTING PRESENCE OF AN INK CONTAINER AND LEVEL OF INK THEREIN

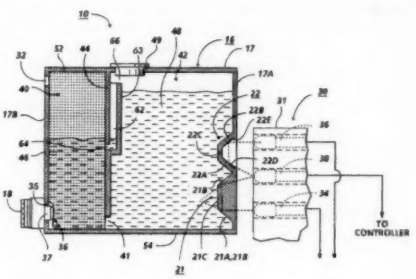
Kenneth W. Altfather, Fairport; Michael Carlotta, Sodus; Steven J. Dieti, Ontario; Donald M. Stevens, Walworth, and Fred F. Hubble, III, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of application No. 09/305,990, filed on May 6, 1999, which is a division of application No. 08/572,595, filed on Dec. 14, 1995, now Pat. No. 5,997,121. This application Feb. 26, 2001, Appl. No. 792,980.

This patent is subject to a terminal disclaimer.

Int. Cl. B41J *2/01*

U.S. Cl. 347—19 **10 Claims**



1. A sensing system for detecting the presence of an ink container comprising:

light directing means operatively connected to said container,

a light source having output beams directed toward said light directing means when in a container detect mode and

photosensor means for detecting the presence or absence of light from said light directing means and for generating an output signal indicative thereof.

US 6,409,303 B1

TWO-STAGE SCRAPER SYSTEM FOR INKJET WIPERS

Jeffrey J. Anderson; Michael S. Millman, both of Vancouver, Wash., and John A. Barinaga, Portland, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 31, 2000, Appl. No. 540,595

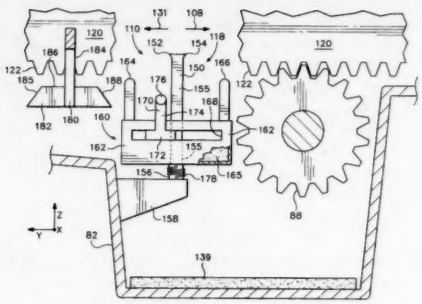
Int. Cl. B41J *2/165*

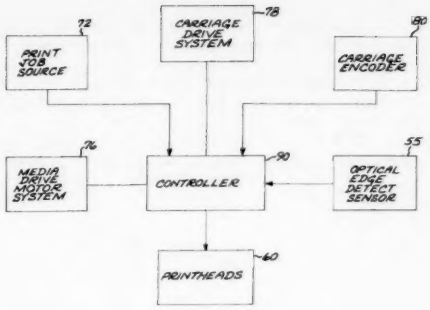
U.S. Cl. 347—28 **22 Claims**

1. A wiper cleaning system for cleaning ink residue from a wiper which has wiped ink residue from an inkjet printhead in an inkjet printing mechanism, comprising:

a coarse scraper which removes the ink residue from a main body portion of the wiper through relative movement of the wiper and the coarse scraper, and leaving a portion of the ink residue remaining on a tip portion of the wiper; and

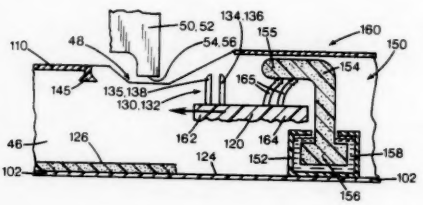
a fine scraper which removes the remaining ink residue from the tip portion of the wiper through relative movement of the





wiper and the fine scraper, wherein the fine scraper is of an absorbent porous plastic material.

US 6,409,304 B1
LIQUID CAPPING SYSTEM FOR SEALING INKJET PRINTHEADS
Bret K Taylor, Vancouver, Wash., assignor to Hewelt-Packard Company, Palo Alto, Calif.
Continuation of application No. 08/838,477, filed on Apr. 7, 1997, now Pat. No. 6,102,518. This application Apr. 28, 2000, Appl. No. 560,800.
This patent is subject to a terminal disclaimer.
Int. Cl. B41J *2/165*
U.S. Cl. 347—29 **30 Claims**

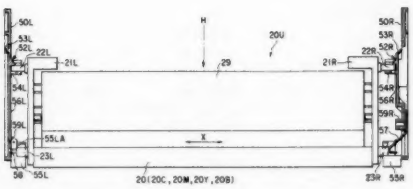


1. A service station for sealing ink ejecting nozzles of an inkjet printhead of a printing mechanism during periods of printing inactivity, comprising:
a reservoir;
a capping liquid stored in the reservoir; and
an applicator that transfers the capping liquid from the reservoir to the printhead and seals the printhead nozzles with the capping liquid by forcing the capping liquid into the nozzles and leaving the capping liquid clinging to the printhead to avoid evaporation of ink components from the printhead.

US 6,409,305 B1
FULL BLEED PRINTMODE TO MINIMIZE OVERSPRAY
Steven B Elgee; Dan Arquilevich, both of Portland, Oreg., and Rick M Tanaka, Vancouver, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 9, 2001, Appl. No. 781,131
Int. Cl. B41J *23/00*
U.S. Cl. 347—37 **19 Claims**

12. An ink jet printing apparatus comprising:
an array of ink jet printing elements;
a support structure for supporting said array of ink jet printing elements for reciprocating movement along a scan axis relative to a print medium such that said ink jet printing elements can print dots on a portion of the print medium that is in a print zone;
a media advance mechanism for advancing the print medium along a media advance axis through the print zone;
an edge sensor for sensing lateral edges of the print medium; and
a controller responsive to said edge sensor for controlling the ink jet printing elements to print dots adjacent the lateral edges in such a manner as to reduce overspray.

US 6,409,306 B1
INK-JET PRINTER
Sakae Shiida, Numazu, Japan, assignor to Toshiba Tec Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 18, 2000, Appl. No. 484,916
Claims priority, application Japan, Jan. 20, 1999, 11-011682
Int. Cl. B41J *2/55*
U.S. Cl. 347—42 **7 Claims**



1. An ink-jet printer comprising:
a medium carrier which carries a print medium;
a head unit which has a plurality of ink-jet nozzles arranged in a width direction of said medium carrier, and ejects ink toward the print medium carried by said medium carrier from said ink-jet nozzles to print an image on the print medium; and
a head supporting mechanism which supports said head unit detachably attached thereto;
wherein said head supporting mechanism includes:
first and second supporting frames facing each other in the width direction of said medium carrier;
first and second supporting sections which are respectively protruded from said first and second supporting frames to receive first and second ends of said head unit put thereon, and support said head unit so as to be slidable in the width direction of said medium carrier;
an urging member which urges the first end of said head unit received by said first supporting section toward said second supporting frame; and
a position adjusting member which slides the second end of said head unit put on said second supporting section toward said first supporting frame against an urging force from said urging member;

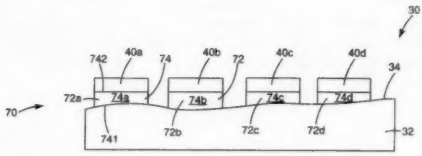
wherein said position adjusting member includes a screw inserted in a screw hole formed through said first supporting frame and said first supporting section.

US 6,409,307 B1

COPLANAR MOUNTING OF PRINTHEAD DIES FOR WIDE-ARRAY INKJET PRINTHEAD ASSEMBLY

Mohammad Akhavain; Robert-Scott Melendrino Lopez, both of Escondido; Dale Dean Timm, Jr., Solana Beach; Janis Horvath, San Diego; Noah Carl Lassar, San Diego; David McElfresh, San Diego; Brian J. Keefe, La Jolla, and Joseph E. Scheffelin, Poway, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 14, 2001, Appl. No. 783,676
Int. Cl. B41J *2/155*
U.S. Cl. 347—42 **35 Claims**



1. An inkjet printhead assembly, comprising:

a substrate having a non-planar surface;

a plurality of adhesive quantities each disposed on the non-planar surface of the substrate; and

a plurality of printhead dies each adhered to the non-planar surface of the substrate by one of the adhesive quantities,

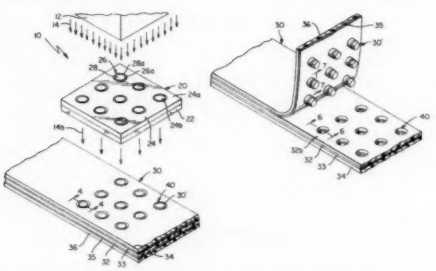
wherein each of the adhesives quantities have a thickness, wherein the thickness of at least one of the adhesive quantities varies from the thickness of another of the adhesive quantities to compensate for the non-planar surface of the substrate, and wherein the adhesive quantities support the printhead dies and establish a substantially coplanar relationship among the printhead dies.

US 6,409,308 B1

METHOD OF FORMING AN INKJET PRINTHEAD NOZZLE STRUCTURE

Colin Geoffrey Maher, and Kent Lee Ubellacker, both of Georgetown, Ky., assignors to Lexmark International, Inc., Lexington, Ky.

Filed Nov. 19, 1999, Appl. No. 443,217
Int. Cl. B41J *2/14;* **B29C** *35/08;* **G01D** *15/00;* **G11B** *5/127*
U.S. Cl. 347—47 **18 Claims**



1. A method of forming one or more nozzles in a polymeric material substrate, comprising the steps of:

providing a laser source adapted to emit a beam of laser energy along a path directed substantially towards said substrate;

providing a mask having one or more openings surrounding one or more opaque mask portions;

positioning said mask between said laser source and said substrate such that said one or more openings of said mask intersect said path of said beam;

emitting said beam substantially along said path towards said substrate;

blocking one or more first portions of said beam with said mask such that one or more second portions of said beam pass through said one or more openings of said mask, said one or more second portions of said beam contacting one or more regions of said substrate such that one or more openings surrounding one or more polymeric material plug portions are formed in said substrate; and,

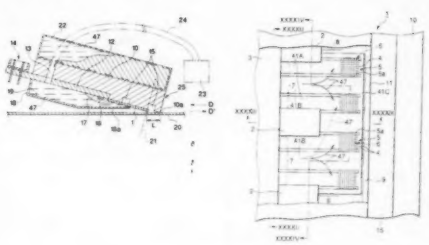
removing said one or more plug portions from said substrate to form nozzles in said substrate.

US 6,409,309 B1

RECORDING APPARATUS HAVING HIGH RESOLUTION RECORDING FUNCTION

Toru Tanikawa, Kanagawa; Minoru Kohno, Tokyo, and Hiroyuki Mitsuhashi, Kanagawa, all of Japan, assignors to Sony Corporation, and Sony Chemicals Corporation, both of Tokyo, Japan

Filed Apr. 17, 1998, Appl. No. 61,944
Int. Cl. B41J *2/04;2/05*
U.S. Cl. 347—54 **39 Claims**



1. A recording apparatus comprising:

a plurality of recording head units constituted by such that recording materials are heated and are selectively transported to a printing medium in a plurality of recording material transporting units; and

a recording head formed by arraying said plurality of recording head units positioned opposite to each other; wherein:

in each of said plurality of recording head units, said plurality of recording material transporting units include heating portions for heating said recording materials;

a first electrode and a second electrode which are used to energize said heating portion are provided with respect to each of said heating portions in such a manner that said first electrode is located opposite to said second electrode; and

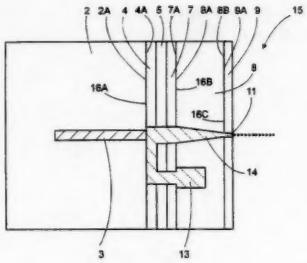
said first electrode among said first and second electrodes is located between said plurality of heating portions;

only said second electrode among said first and second electrodes is present at edge portions of said plurality of recording head units that are positioned opposite to each other.

US 6,409,310 B1
INK-JET PRINT HEAD

Moshe Frenkel, Jerusalem, and Joseph Kaplan, Rishon Lezion, both of Israel, assignors to Idanit Technologies Ltd., Rishon Lezion, Israel

PCT No. PCT/IL97/00437, § 371 Date Jun. 16, 1999, § 102(e) Date Jun. 16, 1999, PCT Pub. No. WO98/29252, PCT Pub. Date Jul. 9, 1998
PCT Filed Dec. 30, 1997, Appl. No. 331,061
Claims priority, application Israel, Dec. 30, 1996, 119944
Int. Cl. B41J *2/04;2/05*
U.S. Cl. 347—54 **5 Claims**



1. An ink jet print head suitable for use with pigment based inks and adapted to be in flow communication with a source of pigment based ink, the ink jet print head comprising:

a composite body formed with an array of ink jet nozzles for respectively emitting a train of pigment based ink droplets, each of said ink jet nozzles being associated with a piezoelectric transducer and adapted for flow communication with the source of pigment based ink via an ink jet duct;

said composite body constituted by a plurality of constituent parts disposed substantially transverse to the direction of emission of a train of ink droplets, said composite body being made from two or more dissimilar metal parts of different electrochemical potential and thereby having one or more pairs of juxtaposed dissimilar metal surfaces each having a relatively large electrochemical potential difference thereacross;

at least one pair of juxtaposed dissimilar metal surfaces having a relatively substantial electrochemical potential thereacross has a protective layer interdisposed therebetween to at least substantially reduce said potential difference,

characterized in that

said composite body includes one or more aluminum parts each having a surface juxtaposed against a dissimilar metal surface, said aluminum parts having at least said surfaces coated, thereby reducing clogging of the ink jet nozzles of the ink jet print head when used with pigment based inks.

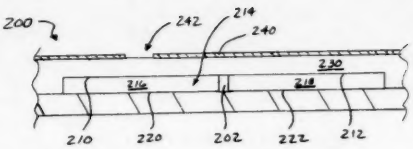
US 6,409,311 B1
BI-DIRECTIONAL FLUID EJECTION SYSTEMS AND METHODS

Arthur M. Gooray; George J. Roller, both of Penfield, N.Y.; Joseph M. Crowley, Morgan Hill, Calif.; Paul C. Galambos; Frank J. Peter, both of Albuquerque, N. Mex.; Kevin R. Zavadil, Bernilillo, N. Mex., and Richard C. Givler, Albuquerque, N. Mex., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 24, 2000, Appl. No. 718,476
Int. Cl. B41J *2/04*
U.S. Cl. 347—54 **14 Claims**

1. A method for ejecting a fluid from a fluid ejector, comprising:

generating a first electrostatic force that moves a first diaphragm of a dual diaphragm arrangement of a fluid ejector in a first direction; and

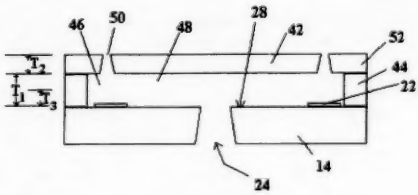


ejecting fluid from the fluid ejector by moving a second diaphragm in a second direction opposite the first direction in response to movement of the first diaphragm in the first direction.

US 6,409,312 B1
INK JET PRINTER NOZZLE PLATE AND PROCESS THEREFOR

James Michael Mrvos, Lexington; Carl Edmond Sullivan, Stamping Ground, and Gary Raymond Williams, Lexington, all of Ky., assignors to Lexmark International, Inc., Lexington, N.Y.

Filed Mar. 27, 2001, Appl. No. 818,736
Int. Cl. B41J *2/04*
U.S. Cl. 347—54 **24 Claims**



18. A method for making a printhead for an ink jet printer, the method comprising the steps of:

providing a semiconductor wafer containing a plurality of printhead chips, the wafer having a device surface and a second surface opposite the device surface;

applying a first negative photoimageable material to the device surface of the wafer;

drying the first negative photoimageable material to provide a first polymer layer;

exposing the first polymer layer to light radiation energy through a mask to provide exposed and unexposed areas in the first polymer layer;

removing the unexposed areas from the first polymer layer to provide ink channels and ink chambers in the first polymer layer;

applying a positive photoresist material to the first polymer layer to fill the ink channels and ink chambers in the first polymer layer;

exposing the positive photoresist material to light radiation energy to provide unexposed areas filling the ink chambers and ink channels and exposed areas of the positive photoresist material;

removing the exposed areas of the positive photoresist material from the first polymer layer;

applying a second negative photoimageable material to the first polymer layer and the unexposed positive photoresist material;

drying the second negative photoimageable material to provide a second polymer layer;

exposing the second polymer layer to light radiation energy through a mask to provide unexposed areas corresponding to nozzle hole locations in the second polymer layer;

removing the unexposed areas from the second polymer layer to provide nozzle holes in the second polymer layer;

removing the positive photoresist material filling the ink channels and ink chambers from the wafer;

dicing the wafer to provide a plurality of nozzle plate/chip assemblies;

connecting a flexible circuit or tape automated bonding (TAB) circuit to the nozzle plate/chip assemblies to provide a plurality of printhead assemblies; and

attaching at least one of the printhead assemblies to a printhead body to provide an ink jet printhead.

US 6,409,313 B1

APPLICATION OF DIFFERENTIAL VOLTAGE TO A PRINTHEAD

Guy Charles Fernley Newcombe, Cambridge, United Kingdom, assignor to Tonejet Corporation Pty Ltd., Eastwood

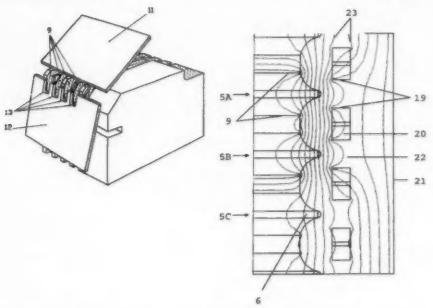
PCT No. PCT/GB98/00888, § 371 Date Aug. 26, 1999, § 102(e) Date Aug. 26, 1999, PCT Pub. No. WO98/42515, PCT Pub. Date Oct. 1, 1998

PCT Filed Mar. 24, 1998, Appl. No. 380,188

Claims priority, application United Kingdom, Mar. 24, 1997, 9706069

Int. Cl. B41J *2/06*

U.S. Cl. 347—55 **8 Claims**



3. An apparatus for ejecting material from a liquid, comprising:

a plurality of chambers for containing the liquid;

a respective ejection electrode and a second electrode associated with each chamber, said second electrode being insulated from the ejection electrode and the liquid;

control means for applying first voltage pulses (A) to the respective ejection electrode associated with a chamber and for applying the second voltage pulses (B) to the respective second electrode associated with the chamber;

the control means controlling the first and second voltage pulses such that, when the first voltage pulses (A) are applied to the ejection electrode, the second voltage pulses (B) are inverted with respect to the first voltage pulses (A).

US 6,409,314 B1

IMAGE FORMING DEVICE AND IMAGE FORMING METHOD

Yoshitaka Kitaoka, Kadoma; Akira Kumon, Katano; Katsutoshi Ogawa, Hirakata; Akira Fukano, Ikoma; Masahiro Aizawa, Takatsuki, and Hiroyuki Matsuo, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan, and Array Aktiebolag, Vastra Frolunda, Sweden

PCT No. PCT/JP99/00349, § 371 Date Jul. 28, 2000, § 102(e) Date Jul. 28, 2000, PCT Pub. No. WO99/38697, PCT Pub. Date Aug. 5, 1999

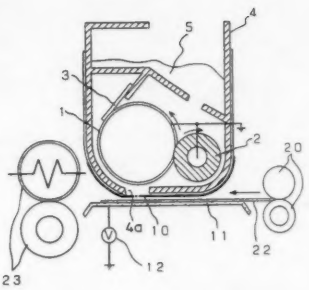
PCT Filed Jan. 27, 1999, Appl. No. 601,147

Claims priority, application Japan, Jan. 30, 1998, 10-019829; Mar. 26, 1998, 10-079061

Int. Cl. B41J *2/06*

U.S. Cl. 347—55 **19 Claims**

1. An image forming apparatus comprising:



a developer carrying member for carrying at least a charged developer in an image formation region;

a counter electrode which is disposed in opposing relation to the developer carrying member in the image formation region, supporting a recording member, and is applied with a predetermined voltage;

an insulating base which is disposed between the developer carrying member and the counter electrode and has a plurality of openings;

image signal electrodes which are provided around the respective openings in the insulating base in opposing relation to said developer carrying member, and impressed with an image signal for controlling the amount of developer supplied from the developer carrying member and passing through the openings being applied; and

a control signal electrode which is provided on the insulating base in opposing relation to the counter electrode and is applied with a voltage always lower than the voltage applied to the image signal electrodes when a developer of negative polarity is used and is applied with a voltage always higher than the voltage applied to the image signal electrodes when a developer of positive polarity is used.

US 6,409,315 B2

SUBSTRATE FOR USE OF AN INK JET RECORDING HEAD, AN INK JET HEAD USING SUCH SUBSTRATE, A METHOD FOR DRIVING SUCH SUBSTRATE, AND AN JET HEAD CARTRIDGE, AND A LIQUID DISCHARGE APPARATUS

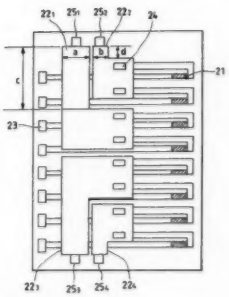
Hirokazu Komuro, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1997, Appl. No. 901,661

Claims priority, application Japan, Jul. 31, 1996, 8-202245

Int. Cl. B41J *2/05*

U.S. Cl. 347—58 **21 Claims**

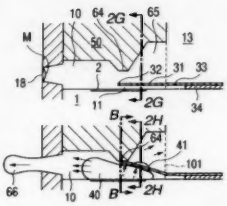


1. In a substrate for an ink jet recording head:

a plurality of heat generating resistors for discharging ink;

a group of electrode pads for receiving electrical power for said heat generating resistors, said electrode pads being located at different distances from their respective heat generating resistors; and

a group of electrodes, each electrode being connected between a selected electrode pad and a set of associated heat generating resistors, said electrodes being configured and arranged such that each electrode presents the same electrical resistance between its associated electrode pad and its set of associated resistors.



US 6,409,316 B1

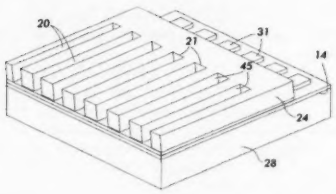
THERMAL INK JET PRINTHEAD WITH CROSSLINKED POLYMER LAYER

Shan C. Clark, Webster, and Thomas W. Smith, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 28, 2000, Appl. No. 536,803

Int. Cl. B41J *2/05*

U.S. Cl. 347—63 **33 Claims**



1. A thermal ink jet printhead which comprises: (i) an upper substrate, and (ii) a lower substrate in which one surface thereof has an array of heating elements and addressing electrodes formed thereon, said lower substrate having an insulative layer deposited on the surface thereof and over the heating elements and addressing electrodes and patterned to form recesses therethrough to expose the heating elements and terminal ends of the addressing electrodes so as to form a plurality of ink channels, said upper and lower substrates being bonded together to form a thermal ink jet printhead having droplet emitting nozzles defined by the upper substrate, the insulative layer on the lower substrate, and the heating elements in the lower substrate, wherein at least one of said upper substrate and said insulative layer comprises a crosslinked polymer formed by crosslinking a precursor polymer which is a phenolic novolac resin having glycidyl ether functional groups on the monomer repeat units thereof.

US 6,409,317 B1

LIQUID DISCHARGE HEAD, LIQUID DISCHARGE METHOD AND LIQUID DISCHARGE APPARATUS

Satoshi Shimazu, Yokohama; Sadayuki Sugama, Tsukuba; Hiroyuki Ishinaga, Tokyo; Yoichi Taneya, Yokohama, and Hiroyuki Sugiyama, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1999, Appl. No. 376,356

Claims priority, application Japan, Aug. 21, 1998, 10-236117; Aug. 21, 1998, 10-236120; Aug. 21, 1998, 10-236122; Aug. 21, 1998, 10-236123; Aug. 21, 1998, 10-236124; Aug. 21, 1998, 10-236125; Aug. 21, 1998, 10-236126

Int. Cl. B41J *2/05*

U.S. Cl. 347—65 **86 Claims**

1. A liquid discharge head comprising:

a heating member for generating thermal energy to create bubble in a liquid;

a discharge port forming a portion to discharge the liquid;

a liquid flow path communicating with said discharge port, having a bubble generation area for enabling liquid to create a bubble;

a movable member arranged in said bubble generation area to be displaced along with development of the bubble; and

a regulating member to regulate displacement of said movable member within a desired range, the liquid being discharged from said discharge port with energy in response to bubble creation,

wherein said liquid flow path holds the bubble during bubbling, and is provided with a gap arranged on a side of said movable member to allow the liquid upstream of the movable member to flow into the bubble generation area when the bubble disappears.

US 6,409,318 B1

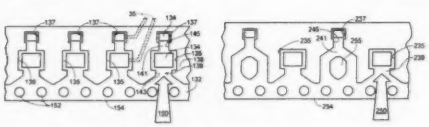
FIRING CHAMBER CONFIGURATION IN FLUID EJECTION DEVICES

Garrett E. Clark, NW Albany, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 30, 2000, Appl. No. 727,823

Int. Cl. B41J *2/05;2/17*

U.S. Cl. 347—65 **21 Claims**



1. An ink-jet printhead comprising:

a substrate;

a first firing chamber and a second firing chamber on the substrate, both chambers being configured for receiving ink that flows into the chambers;

a heat transducer located within the first firing chamber, and a heat transducer located within the second firing chamber; wherein

the first and second firing chambers are in fluid communication to permit ink to flow through the first firing chamber and into the second firing chamber.

US 6,409,319 B1

LIQUID DISCHARGE HEAD, LIQUID DISCHARGE APPARATUS AND LIQUID DISCHARGING METHOD

Yoichi Taneya, Kanagawa; Hiroyuki Ishinaga; Yoshinori Misumi, both of Tokyo, and Hiroyuki Sugiyama, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

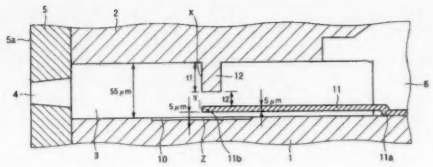
Filed Jul. 30, 2001, Appl. No. 916,471

Claims priority, application Japan, Jul. 31, 2000, 2000-232412

Int. Cl. B41J *2/05*

U.S. Cl. 347—65 **7 Claims**

1. A liquid discharge head, comprising: a heating element which heats liquid in a liquid flow path to produce a bubble in the liquid; a discharge port through which liquid is discharged by pressure involved in bubble growth, the discharge port communicating with the lower part of the liquid flow path and being smaller in the area



of a cross section at right angles to the direction of liquid introduction than the liquid flow path; a movable member which is provided like a cantilever in the liquid flow path, the free end of the member being positioned on the side of the discharge port; and a restrictor which substantially closes the upper part of the liquid flow path by being substantially brought into contact with the movable member when the movable member is displaced by the growth of the bubble,

wherein a meniscus is in the discharge port when due to bubble breakage, the movable member moves from the normal position in such a direction that the liquid flow path is open widely and then returns to the normal position.

US 6,409,320 B1

INK JET PRINTER HEAD AND INK JET PRINTER

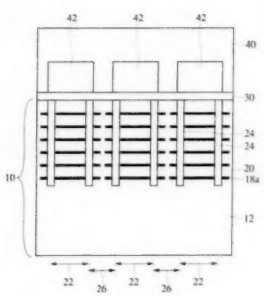
Kazuaki Kurihara, and Michinori Kutami, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 13, 1999, Appl. No. 459,335

Claims priority, application Japan, Dec. 15, 1998, 10-356186

Int. Cl. B41J *2/045*

U.S. Cl. 347—68 **18 Claims**



1. An ink jet printer head comprising:

a piezoelectric device including:

a stress removing electrode formed on a substrate;

a stress removing piezoelectric layer formed on the stress removing electrode; and

a drive layer having a pair of drive electrodes and a piezoelectric layer disposed between the pair of drive electrodes,

the drive layer being divided in a plurality of drive portions and a plurality of non-drive portions by grooves which reach the stress removing piezoelectric layer; and

a channel plate joined to the piezoelectric device on a side where the drive layer is formed, and having a plurality of discrete ink channels formed in parts thereof respectively opposed to said plural drive portions, corresponding to nozzles for jetting ink,

a prescribed voltage being applied between the lowermost drive electrode and the stress removing electrode when the drive portions are driven to thereby mitigate a stress exerted to the stress removing piezoelectric layer.

US 6,409,321 B1

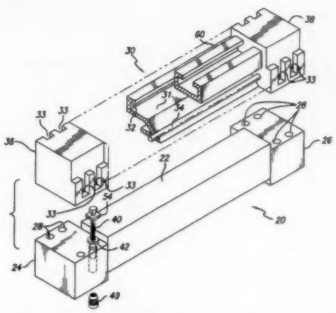
MODULAR PRINTER/PLOTTER WITH CONTROLLABLE PRINTHEAD/MEDIA SPACING IN THREE DEGREES OF FREEDOM

Joaquim Brugue; Manuel Lopez; Jordi Bartolome, and John P. Hannaford, all of Barcelona, Spain, assignors to Hewlett-Packard Company, Fort Collins, Colo.

Filed Mar. 22, 2001, Appl. No. 816,995

Int. Cl. B41J *25/304*

U.S. Cl. 347—84 **16 Claims**



1. A modular printer chassis comprising: a media module which includes a platen for supporting media on which printing is to take place; a carriage module including carriage support structure for supporting a laterally scanning printhead carriage having at least one inkjet printhead thereon in spaced relationship to said platen; and a plurality of fasteners connecting said media module to said carriage module, said fasteners being arranged on spaced lines substantially parallel to carriage movement and being initially adjustable during connect of said modules to relatively position and there permanently hold said modules in a selected position to accurately support a printhead a selected distance from said platen.

US 6,409,322 B1

INK SUPPLY APPARATUS AND INK FILLING METHOD

Tomohiro Ishitsu; Yousuke Tatsumi, and Kouji Terasawa, all of Mitaka, Japan, assignors to Copyer Co., Ltd., Tokyo, Japan

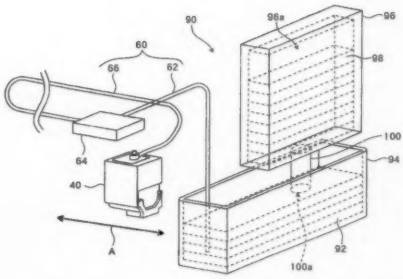
PCT No. PCT/JP98/01027, § 371 Date Nov. 23, 1999, § 102(e) Date Nov. 23, 1999, PCT Pub. No. WO98/40216, PCT Pub. Date Sep. 17, 1998

PCT Filed Mar. 12, 1998, Appl. No. 380,814

Claims priority, application Japan, Mar. 12, 1997, 9-058101

Int. Cl. B41J *2/175*

U.S. Cl. 347—85 **12 Claims**



1. An ink supply device of an ink-jet type image formation apparatus having a carriage reciprocating in a prescribed direction and forming an image by ejection of ink on a recording medium, comprising a printing head having a nozzle and being mounted on the carriage, an ink tank for storing the ink to be supplied to the

printing head, and an ink supply tube for supplying ink from the ink tank to the printing head,

wherein the printing head contains a built-in porous mass of an open-cell structure communicating with the nozzle, and the ink supply tube is connected at the one end to the porous mass hermetically,

wherein an ink supply pipe is provided which is connected to the one end of the ink supply tube and is inserted into the porous mass,

wherein the tip of the ink supply pipe is inserted into the center portion of the porous mass or into the portion thereof nearer to the nozzle than the center portion,

wherein the ink supply pipe has an ink discharging through-hole on the side wall thereof, and

wherein the ink tank comprises an open tank in which the whole liquid ink surface is open to the atmosphere, a connection pipe in contact with the ink in the open tank and extending upward therefrom, and a closed ink tank placed above the open ink tank and storing the ink in a closed state.

US 6,409,323 B1

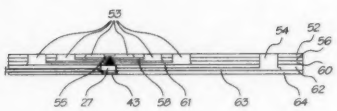
LAMINATED INK DISTRIBUTION ASSEMBLY FOR A PRINTER

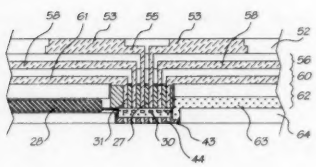
Kia Silverbrook, Balmain, Australia, assignor to Silverbrook Research Pty Ltd, Balmain, Austria

Filed May 23, 2000, Appl. No. 575,115

Int. Cl. B41J *2/175;2/05*

U.S. Cl. 347—85 **15 Claims**





1. An ink distribution assembly for a printhead to which there is mounted an array of print chips, the assembly serving to distribute different inks to each said print chip for printing on print media, the assembly comprising:

a longitudinal distribution housing having ducts for each of said different inks respectively extending longitudinally therealong,

a cover having an ink inlet port communicating with each said duct for delivering each of said different inks to a respective one of said ducts, and

a laminated ink distribution structure fixed to said distribution housing and distributing said inks from said ducts to said print chips, the laminated structure comprising a number of layers adhered to one another, each layer including a plurality of ink holes formed therethrough, each ink hole of one or more of said layers having extending therefrom a recess formed in one side of the layer and allowing passage of ink to a transversely located position of the layer.

US 6,409,324 B1

METHOD AND APPARATUS FOR SUPPLYING INK TO AN PRINTHEAD

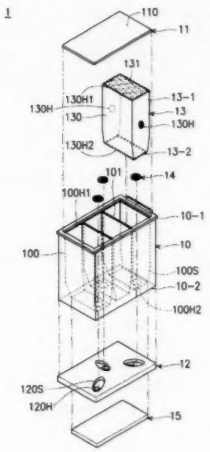
Cheng-Wei Hsu, Tainan Hsien; Shyh-Haur Su, Hsinchu; Chieh-Wen Wang, Hsinchu; I-Chung Hou, Hsinchu, and Charles C. Chang, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Nov. 16, 2000, Appl. No. 714,068

Claims priority, application Taiwan, Jan. 28, 2000, 89101463 A

Int. Cl. B41J *2/175*

U.S. Cl. 347—86 **9 Claims**



1. An apparatus for supplying ink to a printhead, comprising:

a container having an opening connected to said printhead;

a storage chamber in said container;

a bushing comprising at least one hole formed on a sidewall of said bushing; and

a plurality of directional fibers disposed in said bushing and provided with a first controlled capillary portion and a second portion, said first controlled capillary portion having a higher fiber density than said second portion,

wherein the directional fibers receive and store said ink; and

wherein said first controlled capillary portion guides said ink from said second portion to said opening.

US 6,409,325 B1

INK-JET CARTRIDGE AND METHOD OF STORING PRINT HEAD

Toshiya Matsumoto, Yokohama, and Masataka Eida, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1998, Appl. No. 22,551

Claims priority, application Japan, Feb. 14, 1997, 9-030685

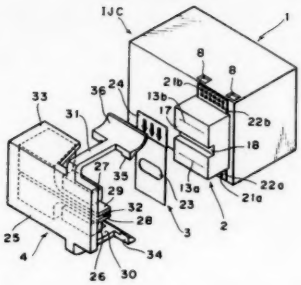
Int. Cl. B41J *2/175;2/165*

U.S. Cl. 347—87 **31 Claims**

1. An ink-jet cartridge, comprising:

a print head portion having a first ejection portion to eject print ink and a second ejection portion to eject liquid containing print performance improving liquid to improve the print performance of the print ink ejected from said first ejection portion by mixing with the print ink and causing the print ink to aggregate or become insoluble, said print head portion being able to be mounted in an ink-jet print apparatus; and

a seal member removably bonded to said print head portion and having an opening through a portion thereof, said seal member closing said first ejection portion and said second ejection



portion so that said opening through said seal member is positioned between said first and second ejection portions.

US 6,409,326 B1

DIGITAL PRINT HEAD

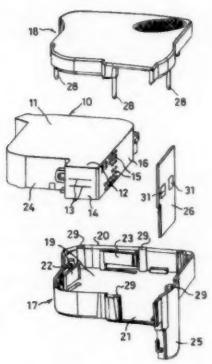
Christopher Michael Giles, Foster City, Calif., and Anthony Lawrence, Potters Bar, United Kingdom, assignors to Neopost Limited, Essex, United Kingdom

Filed Oct. 27, 2000, Appl. No. 697,642

Claims priority, application United Kingdom, Oct. 29, 1999, 9925637

Int. Cl. B41J *2/175*

U.S. Cl. 347—87 **8 Claims**



1. An ink jet print head, including:

an ink jet print module, said module including a plurality of ink jet nozzles in a first exterior surface of said module, selectively operable drivers for ejecting ink from selected ones of said nozzles, and a set of electrical contacts connected to said drivers and located on a second exterior surface of said module;

a housing in which said module is housed, said housing including a wall, an aperture in said wall through which said first exterior surface of said module extends such that said nozzles are located exterior to said housing, and a projection extending outwardly and supporting a set of electrical terminals; and

an electrical connection unit providing electrical connections between electrical contacts of said set of electrical contacts and electrical terminals of said set of electrical terminals.

US 6,409,327 B1

INK JET DEVICE WITH A DISPENSER FOR INK PELLETS

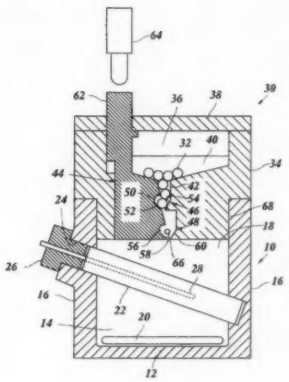
Gerardus A. J. Koeleman, Velden; Jerry Josephus A. C. Roctus, Clinge, and Marc Paul Schuwer, Eindhoven, all of Netherlands, assignors to Oce Technologies B.V., MA Venlo, Netherlands

Filed Nov. 14, 2000, Appl. No. 711,296

Claims priority, application European Pat. Off., Nov. 15, 1999, 99203808

Int. Cl. B41J *2/175*

U.S. Cl. 347—88 **9 Claims**



1. An ink dispensing device for selectively dispensing ink pellets into an ink reservoir which comprises:

a casing and a slide, said casing and said slide defining therebetween a first sluice and a second sluice, each of which is adapted to accommodate at least one ink pellet, said first sluice and said second sluice having similar configurations which contain output chambers terminating in downwardly inclined ramp surfaces, and

means for moving the slide and the casing relative to each other whereby the pellet is discharged from the first sluice into the second sluice and simultaneously the pellet is discharged from the second sluice into the ink reservoir.

US 6,409,328 B1

METHOD OF FORMING IMAGES AND MATERIAL FOR IMAGE FORMATION

Atsuhiro Ohkawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 31, 2000, Appl. No. 541,004

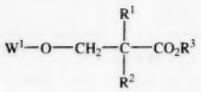
Claims priority, application Japan, Mar. 31, 1999, 11-093088

Int. Cl. G01D *11/00*

U.S. Cl. 347—100 **6 Claims**

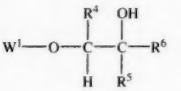
1. An image forming method comprising forming images in an image-forming material by means of a thermal printer head, wherein the image-forming material has on a support an image-forming layer and a protective layer comprised of a binder and a pigment or wax, and the image forming material comprises a compound capable of releasing a strong acid under the action of heat and a compound capable of forming a dye by a reaction with an acid, wherein the compound capable of releasing a strong acid is a compound represented by the following formula (II), (III) or (IV):

(II)



wherein R^1 represents an electron-attracting group having a Hammett's σ_p value greater than 0, R^2 represents an alkyl group, R^3 represents a group eliminable by the action of heat or an acid, and W^1 represents a moiety to constitute the acid of formula W^1OH;

(III)



wherein R^4, R^5 and R^6 each represent a hydrogen atom, an alkyl group or an aryl group, and W^1 represents a moiety to constitute the acid of formula W^1OH; and

$$P^2—X—L—C(R^7)(R^8)—OW^1 \quad (IV)$$

wherein p^2 represents a substituent group eliminable by the action of heat or an acid, X represents O, S, NR^9 or $CR^{10}R^{11}$ wherein R^9 is a hydrogen atom or a group substitutable for hydrogen atom and R^{10} and R^{11}, which may be the same or different, each represents a hydrogen atom or a group substitutable for hydrogen atom, L represents a linkage group, R^7 and R^8, which may be the same or different, each represents a hydrogen atom or a group substitutable for hydrogen atom, and W^1 represents a moiety to constitute the acid of formula W^1OH.

US 6,409,329 B1

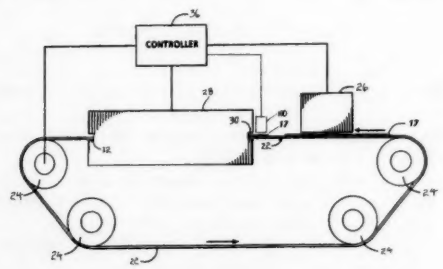
METHOD AND DEVICE TO PREVENT FOREIGN METALLIC OBJECT DAMAGE IN FLUID EJECTION SYSTEMS USING MICROWAVE DRYERS

William L. King, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 30, 2001, Appl. No. 771,553

Int. Cl. B41J *2/01*

U.S. Cl. 347—102 **6 Claims**



3. A fluid ejection system, comprising:

a first metal detector placed near an input slot of a microwave dryer and within a first metal detection range of a transport system;

a second metal detector placed near an output slot of the microwave dryer and within a second metal detection range of the transport system; and

a controller that shuts off power to the microwave dryer in response to a signal from the first metal detector indicating metal has been detected and that restores power to the microwave dryer in response to a signal from the second metal detector indicating that a last metal object detected by the first metal detector has been detected by the second metal detector.

US 6,409,330 B1

SUBLIMATION TRANSFER INK JET RECORDING METHOD AND INK COMPOSITION FOR USE THEREIN

Hiroto Nakamura; Hidehiko Komatsu, and Akio Owatari, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

PCT No. PCT/JP99/03807, § 371 Date Mar. 8, 2000, § 102(e) Date Mar. 8, 2000, PCT Pub. No. WO00/04103, PCT Pub. Date Jan. 27, 2000

PCT Filed Jul. 14, 1999, Appl. No. 508,225

Claims priority, application Japan, Jul. 14, 1998, 10-199144; Apr. 14, 1999, 11-107186

Int. Cl. B41J *2/01*

U.S. Cl. 347—103 **10 Claims**

1. A sublimation transfer ink-jet recording method comprising the steps of: providing an ink composition comprising a heat transferable dye, a glycol ether, an acetylene glycol surfactant and water; said heat transferable dye having a heat activation temperature at which the dye sublimates, said heat activation temperature being above room temperature; printing the ink composition by ink jet recording onto an intermediate transfer medium to form a latent image on the intermediate transfer medium; putting the intermediate transfer medium on the surface of a receptor object; and heating the intermediate transfer medium and the receptor object at a sufficient temperature and for a sufficient time to sublimate the heat transferable dye and to deposit the sublimated dye onto the surface of the receptor object, wherein the heating comprises the steps of raising the temperature of the intermediate transfer medium and the receptor object from room temperature to the heat activation temperature of the heat transferable dye or above; holding the intermediate transfer medium and the receptor object at the heat activation temperature of the heat transferable dye or above; and then decreasing the temperature of the intermediate transfer medium and the receptor object to room temperature.

US 6,409,331 B1

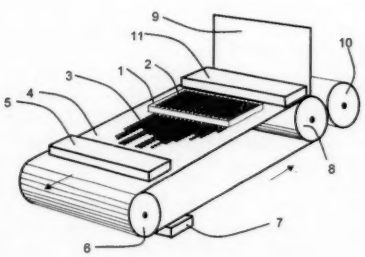
METHODS FOR TRANSFERRING FLUID DROPLET PATTERNS TO SUBSTRATES VIA TRANSFERRING SURFACES

Daniel Gelbart, Vancouver, Canada, assignor to Creo Srl, Burnaby, Canada

Filed Aug. 30, 2000, Appl. No. 654,247

Int. Cl. B41J *2/01*

U.S. Cl. 347—103 **12 Claims**



2. A method for image-wise transferring a pattern of fluid droplets from a two-dimensional array of fluid droplet sources onto a substrate via an intermediate transferring surface, said fluid droplet sources in said array being aligned with one another in a

direction of motion of said transferring surface relative to said array, and said method comprising

a) depositing a first subset of said fluid droplets of said pattern onto said transferring surface from more than one of said fluid droplet sources in-line with the direction of motion of said transferring surface;

b) changing properties of said subset of fluid droplets of said pattern after said fluid droplets have been emitted from said fluid droplet sources; and

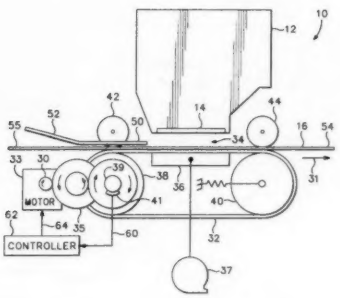
c) transferring said subset of said fluid droplets from said transferring surface to said substrate; and

d) repeating steps a, b and c in the same order for all remaining subsets of said fluid droplets of said pattern in series.

US 6,409,332 B1
LOW FLOW VACUUM PLATEN FOR INK-JET HARD COPY APPARATUS

Robert M Yraceburu, Circle Camas; Steve O Rasmussen, Vancouver, and James O Beehler, Brush Prairie, all of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 28, 2000, Appl. No. 514,830
Int. Cl. B41J *2/01*
U.S. Cl. 347—104 **12 Claims**



1. A print media vacuum platen system comprising:

a vacuum box, having at least one surface thereof further comprising a filter means for permitting airflow therethrough and having a porous material associated with ink-jet contaminant sizes and predetermined vacuum pressure drop levels;

associated with the vacuum box, vacuum means for creating a negative pressure within the vacuum box and inducing the airflow through the filter means; and

mounted adjacently to the filter means and distally from the vacuum box, platen means for holding print media in a position for ink-jet printing thereon, the platen means having a plurality of vacuum passages therethrough such that regions of the filter means form a porous floor for each of the passages.

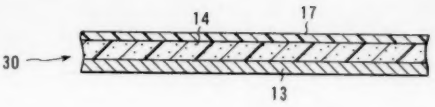
US 6,409,333 B1
INK JET PRINTING MEDIUM FOR AN EMBOSSED INTERIOR DECORATING MEMBER

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1999, Appl. No. 452,498
Claims priority, application Japan, Dec. 3, 1998, 10-344035; Mar. 1, 1999, 11-052777; Mar. 31, 1999, 11-093797
Int. Cl. B41J *2/01;* **G81D** *11/00*
U.S. Cl. 347—105 **21 Claims**

1. An ink jet printing medium for an embossed interior decorating member, comprising:

a base member having a face,



a thermoplastic resin layer deposited on the face of the base member, and made of a material comprising a thermoplastic resin and a heating foaming agent dispersed in the thermoplastic resin, and

a non-aqueous and porous ink receiving layer deposited on the thermoplastic resin layer,

wherein the ink receiving layer has a pore size of 30 μm or less.

US 6,409,334 B1
INK JET PRINTING METHOD

Bruce C. Campbell; Lixin Chu, both of Rochester; Thomas M. Laney, Brockport, and Lisa B. Todd, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 2000, Appl. No. 650,129
Int. Cl. B41J *3/407*
U.S. Cl. 347—106 **19 Claims**

1. An ink jet printing method, comprising the steps of:

A) providing an ink jet printer that is responsive to digital data signals;

B) loading said printer with ink jet recording elements comprising an ink-permeable polyester substrate comprising a base polyester layer and an ink-permeable upper polyester layer, said ink-permeable upper polyester layer having interconnecting voids, said ink-permeable upper polyester layer comprising a continuous polyester phase having an ink absorbency rate resulting in a dry time of less than about 10 seconds and a total absorbent capacity of at least about 14 cc/m^2, said ink-permeable upper polyester layer having thereon a porous image-receiving layer having interconnecting voids;

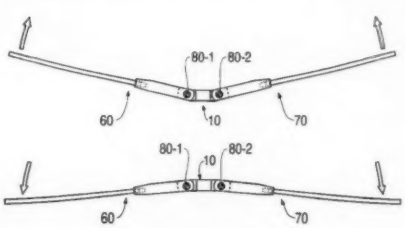
C) loading said printer with an ink jet ink composition, and

D) printing on said ink jet recording element using said ink jet ink in response to said digital data signals.

US 6,409,335 B1
FOLDABLE EYEWEAR

Steven R. Lipawsky, 6767 NW. 84 Ave., Parkland, Fla. 33067, assignor to Steven R. Lipawsky, Miami, Fla.

Provisional application No. 60/168,019, filed on Nov. 30, 1999. This application Nov. 21, 2000, Appl. No. 716,246.
Int. Cl. G02C *5/08;5/02*
U.S. Cl. 351—63 **15 Claims**



1. Foldable eyewear, comprising:

a bridge;

a first lens rim;

a second lens rim;

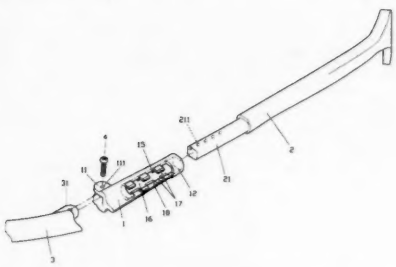
a first lens rim-bridge connector rotatably connecting said first lens rim to said bridge, said first lens rim-bridge connector having a cavity that houses a compressed spring, said com-

pressed spring exerting force against said bridge to provide a stable hinged connection between said first lens rim and said bridge; and

a second lens rim-bridge connector rotatably connecting said second lens rim to said bridge, wherein said first and second lens rims rotate relative to said bridge to be substantially parallel,

wherein said hinged connection between said first lens rim-bridge connector and said bridge is configured for rotation of said first lens rim-bridge connector from an unfolded position, in which said first lens rim-bridge connector is aligned with said bridge, to a folded position, in which said first lens rim-bridge connector is substantially perpendicular to said bridge, said hinged connection between said first lens rim-bridge connector and said bridge further being configured for rotation of said first lens rim-bridge connector from said unfolded position, in an opposite rotation direction than the rotation direction for reaching said folded position, to a hyper-extended position.

US 6,409,336 B1
ADJUSTABLE GLASSES FOOT
Yao-Ling Kuo, B1, No. 104, Lee Ming Rd., Shin Diann, Taiwan
Filed Jun. 26, 2001, Appl. No. 888,477
Int. Cl. G02C *5/20*
U.S. Cl. 351—118 **2 Claims**



1. An adjustable glasses foot comprising a first foot section and a second foot section, a front end of said first foot section being connected to a glasses frame, and the improvements comprising:

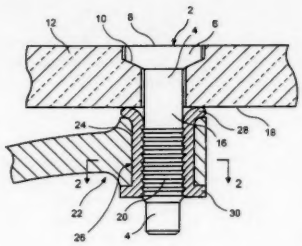
said first foot section being formed with a sleeve at a rear end and a space connecting with said sleeve, said first foot section having elastic members on one side of said space, and locating holes on the other side of said space;

said second foot section having an insertion rod at a front end relative to said sleeve and said space, a few of studs extending outwardly from one side of said insertion rod relative to said locating holes;

thus, said insertion rod of said second foot section being inserted into said sleeve and said space of said first foot section, said studs of said insertion rod extending from said locating holes of said space and being secured by said elastic members therein.

US 6,409,337 B1
CONNECTION ASSEMBLY FOR FRAMELESS EYEGLASSES
Dominique Delamour, Les Mesnuls; Olivier Rodi, Saulx-Marchais, and Alain Miklitarian, Paris, all of France, assignors to WIS Sarl, Paris, France
Filed Mar. 9, 2001, Appl. No. 802,774
Int. Cl. G02C *5/00*
U.S. Cl. 351—146 **12 Claims**

1. An assembly for connecting a lens to a temple of eyeglasses, comprising:



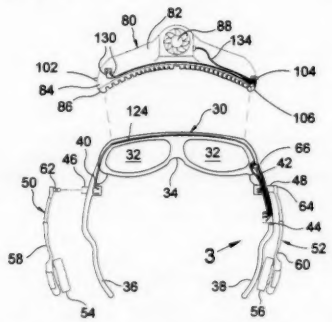
a plug comprising an elongate stem and a broad head on an upper end of the stem,

a lower portion of the stem having a radial extension means,

a tubular collar made of a deformable material, the tubular collar residing within a conformingly shaped open end of the temple,

an inside diameter of the collar being smaller than an outermost diameter of the extension means, to a relative degree such that the lower portion of the stem may pass through the deformable collar upon longitudinal force being applied to the stem, while the collar retains the stem therein upon the release of said force.

US 6,409,338 B1
AIR-GENERATING AUDIBLE SPECTACLES DEVICE
Frank Saleem Jewell, 713 Knollwood Dr., Hendersonville, N.C. 28791
Filed Sep. 25, 2000, Appl. No. 669,510
Int. Cl. G02C *1/00*
U.S. Cl. 351—158 **40 Claims**



1. A headphone device for use in listening to sound generated by an electronic audio device, comprising:

a left earphone and a right earphone, each earphone having a speaker assembly, each earphone further having an extension member attached to the speaker assembly, each extension member having a coupler;

a sunglasses unit, the sunglasses unit having:

a sunglasses frame, having left and right lenses;

a sunglasses unit audio receiving jack for receiving electronic audio signals from the electronic audio device, said audio receiving jack adapted to receive electric power;

a left sunglasses unit earphone coupler and a right sunglasses unit earphone coupler, each sunglasses unit earphone coupler being in electronic audio communication with the audio receiving jack, each sunglasses unit earphone coupler being adapted for coupling with one of the left and right earphone extension member couplers, such that each earphone extension member coupler is in electronic audio communication with such sunglasses unit earphone coupler; and

an auxiliary power coupler to provide power take off mounted on said sunglasses frame connected to receive electric power from said audio receiving jack.

US 6,409,339 B1

MULTIFOCAL LENS, AND METHOD FOR PRODUCTION THEREOF

Bernardus Franciscus Maria Wanders, Angerlo, Netherlands, assignor to Procornea Holdings B.V., Eerbeek, Netherlands

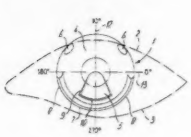
Continuation-in-part of application No. PCT/NL96/00428, filed on Oct. 31, 1996, now Pat. No. 6,092,899. This application Jun. 16, 2000, Appl. No. 595,208.

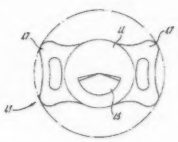
Claims priority, application Netherlands, Oct. 31, 1995, 1001540; May 17, 1996, 1003158

This patent is subject to a terminal disclaimer.

Int. Cl. G02C *7/04;* **A61F** *2/16*

U.S. Cl. 351—161 **27 Claims**





1. Multifocal contact lens provided with a reading portion in the lower lens part and another lens portion in its upper part, wherein the reading portion comprises a recess which is bounded on all sides by the remaining lens part, and in that the outer limit of the reading portion lies on or within an imaginary sphere having its origin and radius of curvature coinciding with the radius R_v of said other lens portion.

US 6,409,340 B1

MULTIFOCAL OPHTHALMIC LENS

Valdemar Portney, 11940 N. Riviera, Tustin, Calif. 92782

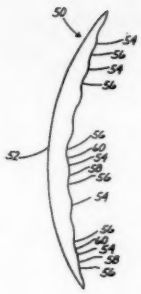
Division of application No. 09/187,116, filed on Nov. 4, 1998, now Pat. No. 6,186,625, which is a division of application No. 08/811,985, filed on Mar. 5, 1997, now Pat. No. 5,877,839, which is a division of application No. 08/592,164, filed on Jan. 26, 1996, now Pat. No. 5,657,108, which is a division of application No. 08/122,822, filed on Sep. 16, 1993, now Pat. No. 5,521,656, which is a division of application No. 07/935,586, filed on Aug. 26, 1992, now Pat. No. 5,270,744, which is a division of application No. 07/465,477, filed on Jan. 16, 1990, now Pat. No. 5,166,712, which is a division of application No. 07/366,319, filed on Jun. 14, 1989, now Pat. No. 4,898,461, which is a continuation of application No. 07/056,050, filed on Jun. 1, 1987, now abandoned. This application Nov. 27, 2000, Appl. No. 722,918.

This patent is subject to a terminal disclaimer.

Int. Cl. G02C *7/04*

U.S. Cl. 351—161 **12 Claims**

1. A method comprising shaping first, second and third at least partially annular regions of a surface to provide the first region with a first vision correction power, the second region with a second vision correction power which is different from the first vision correction power to enhance vision at first and second different distances, respectively, and the third region between said first and second regions to provide vision correction powers which include vision correction powers which are between the first and second vision correction powers, the third region including progressive vision correction powers.



US 6,409,341 B1

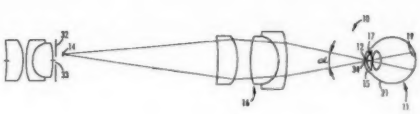
EYE VIEWING DEVICE FOR RETINAL VIEWING THROUGH UNDILATED PUPIL

Ervin Goldfain, Syracuse; William Lagerway, Auburn; Chris R. Roberts, Skaneateles; Steven R. Slawson, Camillus, and Allan I. Krauter, Skaneateles, all of N.Y., assignors to Hand Held Products, Inc., Skaneateles Falls, N.Y.

Continuation-in-part of application No. 09/198,545, filed on Nov. 24, 1998, now Pat. No. 6,065,837. This application Nov. 22, 1999, Appl. No. 444,161.

Int. Cl. A61B *3/10*

U.S. Cl. 351—205 **118 Claims**



1. An eye viewing device for viewing a structure of an eye having a pupil, said device comprising:

an illumination system generating a converging cone of light that converges at an apex and diverges thereafter;

an imaging system having an imaging axis, wherein said illumination system includes a light source positioned off-axis with respect to said imaging axis; and

an aperture stop disposed in said device substantially coaxial with said imaging axis and substantially conjugate to said apex whereby internal and corneal glare in said device is reduced.

US 6,409,342 B1

GLAUCOMA DIAGNOSIS APPARATUS AND RECORDING MEDIUM FOR GLAUCOMA DIAGNOSIS

Kazuhiko Ohnuma, Sodegaura; Yasufumi Fukuma, and Hidetaka Aeba, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Topcon, Tokyo, Japan

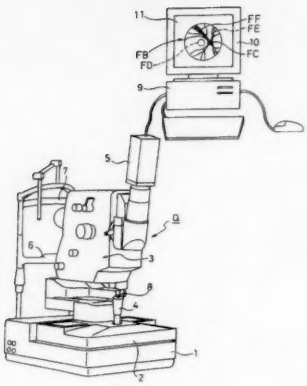
Filed Oct. 30, 2000, Appl. No. 698,039

Claims priority, application Japan, Oct. 28, 1999, 11-306494

Int. Cl. A61B *3/14*

U.S. Cl. 351—206 **13 Claims**

1. A glaucoma diagnosis apparatus, wherein image data corresponding to a reflection intensity of a light of short wavelength is divided by image data corresponding to a reflection intensity of a light of longer wavelength to produce reflected light intensity ratio data for each part of a fundus image photographed by a color



fundus camera, and glaucoma is diagnosed based on the reflected light intensity ratio data.

US 6,409,343 B1

OPHTHALMIC APPARATUS

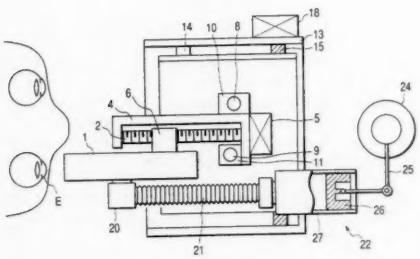
Koji Uchida, Utsunomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1999, Appl. No. 412,498

Claims priority, application Japan, Oct. 8, 1998, 10-300337

Int. Cl. A61B *3/14*

U.S. Cl. 351—208 **14 Claims**



1. An ophthalmic apparatus comprising:

a measurement unit for measuring an eye to be examined;

an illumination light source disposed near the measurement unit, for illuminating the eye;

an area sensor for picking up an image of the eye illuminated by said illumination light source;

driving means for driving said measurement unit relative to the eye forward or backward;

determining means for determining whether signal levels throughout an entire area of said area sensor are not more than a predetermined level; and

control means for controlling said driving means so as to drive the measurement unit away from said eye, when said determining means determines that the signal levels are not more than the predetermined level.

US 6,409,344 B1

OCULAR REFRACTIVE-POWER MEASURING DEVICE

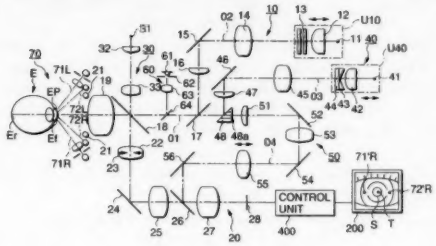
Takefumi Hayashi, Tokyo, Japan, assignor to Kabushiki Kaisha, Topcon, Tokyo, Japan

Filed Jul. 7, 2000, Appl. No. 612,626

Claims priority, application Japan, Jul. 15, 1999, 11-201775

Int. Cl. A61B *3/14*

U.S. Cl. 351—208 **6 Claims**



1. An ocular refractive-power measuring device for measuring the refractive power of an eye to be examined, comprising:

a refractive power measuring unit projecting pattern light rays for refractive power measurement onto a fundus of the eye to be examined, receiving the reflected light of the pattern light rays from the fundus by a light receiving element and measuring the refractive power of the eye to be examined on the basis of a shape of the pattern light rays projected onto said light receiving element;

an alignment detecting unit projecting light rays for alignment detection toward the eye to be examined and detecting a state of alignment between a vertex of a cornea of the eye to be examined and a device body on the basis of corneal reflecting light of the light rays for alignment detection;

an alignment unit aligning said device body on the basis of an output of said alignment detecting unit;

a storage unit storing the shape of the pattern light rays received by said light receiving element; and

an eclipse detecting unit detecting the presence of an eclipse in the pattern light rays due to a pupil of the eye to be examined on the basis of the shape of the pattern light rays stored in said storage unit, and a direction of the eclipse,

wherein, when said eclipse detecting unit determines that the eclipse is present, said alignment unit moves a position of said device body on the basis of a result of detection by said eclipse detecting unit such as to adjust an alignment between the pupil of the eye to be examined and said device body.

US 6,409,345 B1

METHOD AND DEVICE FOR SYNCHRONOUS MAPPING OF THE TOTAL REFRACTION NON-HOMOGENEITY OF THE EYE AND ITS REFRACTIVE COMPONENTS

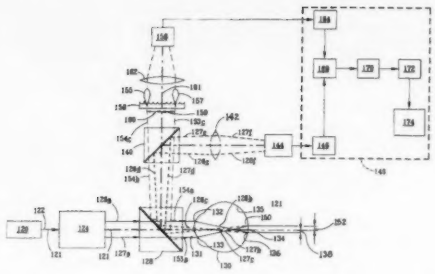
Vasyl V. Molebny, Kiev, Ukraine; Ioannis Pallikaris, Heraklion Crete, Greece; Youssef Wakil, Houston, Tex., and Sergiy Molebny, Kiev, Ukraine, assignors to Tracey Technologies, LLC, Houston, Tex.

Filed Aug. 8, 2000, Appl. No. 634,487

Int. Cl. A61B *3/10*

U.S. Cl. 351—212 **30 Claims**

1. A device for measuring aberration refraction of an eye, comprising: a polarized light source producing a probing beam along a path to the eye; a telescopic system of lenses having an entrance pupil and an exit pupil; a two-coordinate deflector consisting of two single-coordinate deflectors separated by a zone; a deflection control unit; an aperture stop; a field stop; a collimating lens; a first position-sensitive photodetector with an objective lens operatively positioned for receiving non-polarized light reflected from the retina of the eye, a second position-sensitive photodetector for simultaneously receiving polarized light reflected from the cornea of the eye; and a data processing and display unit including

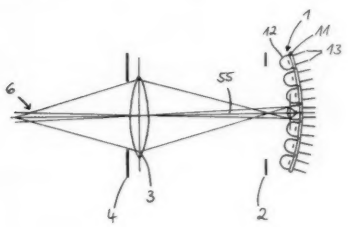


a computer coupled to said first and second photodetectors for calculating total eye refraction aberration and the component caused by cornea aberration.

US 6,409,346 B1
SLIT PROJECTOR

Gert Koest, Hannover, and Marc Repnow, Bremen, both of Germany, assignors to Oculus Optikgeraete GmbH, Wetzlar-Dutenhofen, Germany

Filed Jul. 26, 2000, Appl. No. 626,320
Claims priority, application Germany, Aug. 4, 1999, 299 13 603
Int. Cl. A61B *3/10*
U.S. Cl. 351—214 **14 Claims**



1. A slit projector comprising a light source, a slit diaphragm arranged in front of the light source, and a lens system arranged in front of the slit diaphragm, in particular for slit lamps, wherein the light source consists of several light diodes arranged in a longitudinal direction of the slit, namely in the plane of the projected slit.

US 6,409,347 B1
PROJECTOR, CIRCUIT BOARD, AND ELECTRONIC DEVICE PROVIDED WITH SAID CIRCUIT BOARD

Akitoshi Kuroda, Yamagata-mura; Toshihiko Nakazawa; Takeshi Takizawa, both of Shiojiri; Mutsuya Furuhata, Hata-machi, and Fumio Koyama, Shiojiri, all of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

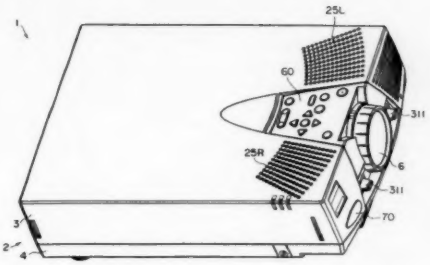
Filed Jun. 10, 1999, Appl. No. 329,361
Claims priority, application Japan, Jun. 11, 1998, 10-163973; Jun. 22, 1998, 10-175107; Jun. 25, 1998, 10-179273
Int. Cl. G03B *21/00;* **H05K** *9/00*
U.S. Cl. 353—31 **22 Claims**

1. A projector, comprising:

an optical system having optical axes defining a plane that optically processes a luminous flux emitted from a light source to form an optical image according to image information;

a projection lens that enlarges and projects an image formed by the optical system;

a circuit board that controls the projector,



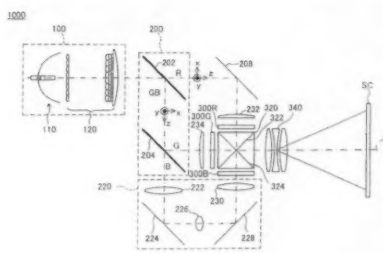
a casing that substantially covers the optical system, the projection lens, and the circuit board in entirety, said circuit board being substantially perpendicular to the plane defined by the optical axes of said optical system and disposed on an outside of said plane defined in said optical system; and

an optical modulation-device driving system that drives and controls an optical modulation device constituting said optical system, said optical-modulation-device driving system being divided into an individual-setting section set according to specifications of said optical-modulation-device and a common-setting section set in common without depending on the specifications of said optical-modulation-device.

US 6,409,348 B1
PROJECTOR

Kazuo Aoki, Chino, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Sep. 1, 2000, Appl. No. 654,065
Claims priority, application Japan, Sep. 8, 1999, 11-253744
Int. Cl. G03B *21/00;21/26;21/28;5/22;* **G02F** *1/1335*
U.S. Cl. 353—31 **8 Claims**



1. A projector that projects and displays an image, comprising:

a light source;

a wavelength separating optical system that separates light emitted from said light source into a plurality of wavelength regions;

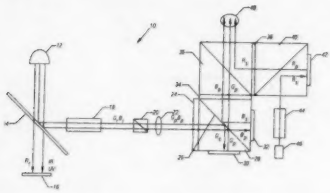
plural light modulation devices provided respectively for light in the plural wavelength regions emitted from said wavelength separating optical system that modulate the light in the plural wavelength regions according to a given image signal;

a light synthesizing optical system that synthesizes the light in the plural wavelength regions modulated by said plural light modulation devices;

a projection optical system that projects the synthesized light emitted from said light synthesizing optical system; and

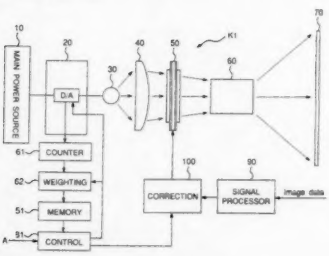
a reflecting mirror, having a reflectance of approximately 90% or more for light in the wavelength region of approximately 435 nm or more, and a reflectance for light in the wavelength region of at least 425 nm±5 nm, that is lower than the reflectance for the light in the wavelength region of approximately 435 nm or more, placed in an optical path from said light source to at least one of said light modulation devices.

US 6,409,349 B1
ENHANCING SPECTRAL LUMINOSITY IN PROJECTION DISPLAYS
Michael O'Connor, Cupertino, Calif., assignor to Intel Corporation, Santa Clara, Calif.
Filed Dec. 1, 2000, Appl. No. 728,854
Int. Cl. G03B *21/14*
U.S. Cl. 353—31 **18 Claims**



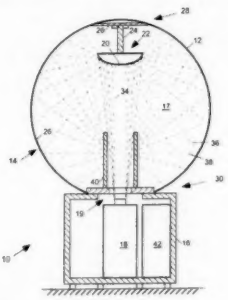
9. A modulation engine comprising:
a first light source that generates light including first and second color components;
a beam splitter that splits the first color component from the second color component;
a first modulator that modulates said second color component;
a second light source that generates light of said first color;
a second modulator that modulates said light from said second source; and
a combiner that combines said modulated light from the first and second sources.

US 6,409,350 B1
LCD PROJECTOR
Yasuhiro Kakimoto; Toshiyuki Noguchi, and Mitsuru Kotaka, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
PCT No. PCT/JP99/01096, § 371 Date Oct. 26, 2000, § 102(e) Date Oct. 26, 2000, PCT Pub. No. WO99/45714, PCT Pub. Date Sep. 10, 1999
PCT Filed Mar. 5, 1999, Appl. No. 623,412
Claims priority, application Japan, Mar. 6, 1998, 10-54682; Sep. 11, 1998, 10-258257
Int. Cl. G03B *21/14*
U.S. Cl. 353—85 **13 Claims**



1. An LCD projector comprising:
a power source (**11**, **20**);
an image data input for producing an image data;
a light source (**30**) which is capable of emitting light with R, G, B components and to provide different levels of power; wherein the change in output power of the power source (**20**) is used to change the output power of the light source (**30**);
a LCD panel (**50**) for modifying light rays from the light source (**30**) in accordance with said image data to produce light rays of an image;
a projecting lens (**60**) for projecting the light rays from the LCD panel (**50**) onto a screen (**70**) through enlargement;
a control circuit (**81**) for controlling an output of the power source so as to selectively set an output power:
a correcting circuit (**100**) for correcting image data before being supplied to the LCD panel (**50**) so as to compensate the disturbance of the white balance caused by the change of the power of the light source (**30**),
a counter (**61**) for counting an integrated on-state period of the light source; and
a memory (**51**) for storing the integrated on-state period of the light source, which is connected to the counter and the control circuit;
wherein the control circuit (**81**) changes the output of the power source (**20**) upon lapse of the integrated on-state period of the light source (**30**) stored by the memory (**51**) so as to keep luminance of the light source (**30**) constant.

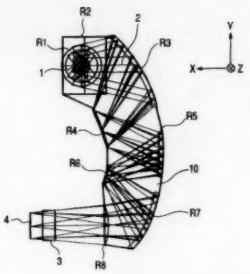
US 6,409,351 B1
SPHERICAL IMAGE PROJECTION SYSTEM USING A CONVEX REFLECTING IMAGE DISPERSING ELEMENT
Thomas R. Ligon, 2938 N. Madison, Loveland, Colo. 80538
Filed Feb. 12, 2001, Appl. No. 781,935
Int. Cl. G03B *21/28*
U.S. Cl. 353—98 **24 Claims**



1. An apparatus for displaying images, the apparatus comprising:
a screen having an inner surface substantially enclosing a three-dimensional space;
first projection means for projecting a first image; and
a first mirror having a first convex surface positioned within the three-dimensional space for reflecting and dispersing the first image projected by the first projection means onto the inner surface of the screen.

US 6,409,352 B1
OPTICAL SYSTEM, OPTICAL ELEMENT, AND OPTICAL DEVICE HAVING THE SAME
Toshihiro Sunaga, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 28, 2000, Appl. No. 648,738
Claims priority, application Japan, Aug. 30, 1999, 11-243168
Int. Cl. G02B *5/10*
U.S. Cl. 359—859 **5 Claims**

1. An optical element comprising:
a plurality of reflective curved surfaces for successively reflecting light incident to said optical element, said plurality of reflective curved surfaces comprising a reflective curved surface for first reflecting the light incident to said optical element, as a surface A, a reflective curved surface for next reflecting the light reflected by the surface A, as a surface B, a reflective curved surface for finally reflecting the light incident to said optical element, as a surface D, and a reflective curved surface immediately before the surface D, as a surface C,
wherein, in the order of the path of the light incident on said optical element, a first optical component is defined before the



surface A, a second optical component from the surface B to the surface C, and a third optical component after the surface D and wherein, where $fB1(\theta)$, $fB2(\theta)$, and $fB3(\theta)$ are focal lengths of said first optical component, said second optical component, and said third optical component, respectively, at an azimuth θ, the focal lengths satisfy the following conditions in the azimuth range of $0 \leqq \theta < 2\pi$:

$fB1(\theta) > 0$,

$fB2(\theta) < 0$,

$fB3(\theta) > 0$,

wherein, $f(\theta)$ is the total focal length of said optical element at the azimuth θ, and the focal length satisfies the following condition in the azimuth range of $0 < \theta < 2\pi$:

$|f(\theta)|/2 < fB1(\theta) < 2|f(\theta)|$.

US 6,409,353 B1

ADJUSTABLE REARVIEW MIRROR ASSEMBLY

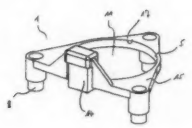
Richard Guttenberger, Greding, Germany, assignor to Bühler Motor GmbH, Nürnberg, Germany

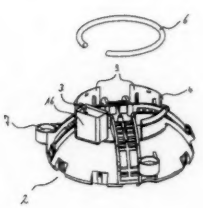
Filed Jul. 6, 2001, Appl. No. 899,574

Claims priority, application Germany, Jul. 7, 2000, 100 33 088

Int. Cl. G02B *7/182*

U.S. Cl. 359—879 **23 Claims**





1. An adjustable rearview mirror for a vehicle, the rearview mirror comprising:

a drive housing;

a mirror carrier;

snapping segments secured to one of the drive housing and the mirror carrier, and an edge defined on the other of the drive housing and the mirror carrier, said edge mating with the snapping segments to connect the drive housing to the mirror carrier, and wherein the mirror carrier and the drive housing each have electrical contacts that are embodied in such a way that, during the snapping together of the mirror carrier and the drive housing, an electrical connection is created between the mirror carrier and the drive housing at the same time.

US 6,409,354 B1

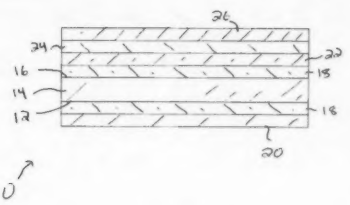
TRANSPARENT PLASTIC OR POLYMER BASED MIRROR APPARATUS AND METHOD FOR MAKING THE SAME

David A. Richard, Shingles Springs, Calif., assignor to VTEC Technologies, Inc., Chestnut Hill, Mass.

Provisional application No. 60/227,194, filed on Aug. 23, 2000. This application Jul. 27, 2001, Appl. No. 916,777.

Int. Cl. G02B *7/182*

U.S. Cl. 359—883 **44 Claims**



1. A polymer-based mirror, comprising:

a transparent synthetic resin substrate having an anterior surface and a posterior surface;

a multi-layer abrasion resistant coating formed adjacent to said anterior surface of said synthetic resin substrate, wherein at least one layer of said multi-layer abrasion resistant coating includes zirconia;

a multi-layer reflective coating formed adjacent to one of said posterior surface of said synthetic resin substrate and said abrasion resistant coating, wherein at least one layer of said multi-layer reflective coating includes zirconia; and

a protective back-coat layer formed over an outer surface of said reflective coating.

US 6,409,355 B1

COMBINATION INSTRUMENT

Ernst-Ulrich Simon, Oberursel; Hans Kolibius, Babenhausen, and Stephan Zech, Eltville, all of Germany, assignors to Mannesmann VDO AG, Frankfurt, Germany

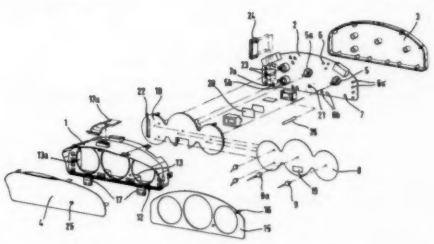
PCT No. PCT/EP97/04281, § 371 Date Jun. 1, 2000, § 102(e) Date Jun. 1, 2000, PCT Pub. No. WO98/06594, PCT Pub. Date Feb. 19, 1998

PCT Filed Aug. 6, 1997, Appl. No. 242,164

Claims priority, application Germany, Aug. 10, 1996, 196 32 381

Int. Cl. G09G *3/00*

U.S. Cl. 362—23 **29 Claims**



1. A combination instrument for a motor vehicle, comprising:

a front frame, and a printed circuit board arranged behind the front frame;

a display panel with display instruments and light sources including warning lights for displaying information on the display panel, the display instruments and the warning lights being attached to the printed circuit board and being in electrical contact with the printed circuit board, the display instruments being larger than the warning lights and extend-

ing from the printed circuit board to a location forward of the warning lights, the display instruments being located between the display panel and the present circuit board;

light shafts arranged between the warning lights and the display panel, the light shafts extending from the warning lights as well as other lights at the printed circuit board past a display instrument of said display instruments to the display panel, the light shafts conducting light from the lights to locations on the display panel to the side of and in front of at least one of the display instruments;

wherein the front frame has cutouts for display areas of the display instruments;

the front frame holds a viewing window arranged in front of the display panel;

the front frame is produced integrally with the light shafts as a single assembly and constituting a single component of the combination instrument;

the display panel includes a transparent diaphragm screen which is attached to the front frame and has cutouts for the display areas of the display instruments; and

the printed circuit board contacts ends of the light shafts distant from the display panel and bears against the light shafts and/or against spacers of the front frame.

US 6,409,356 B1

LIQUID CRYSTAL DISPLAY HAVING LIGHT-TRANSMITTING MEMBER IN FRONT OF LIGHT-GENERATING SECTION

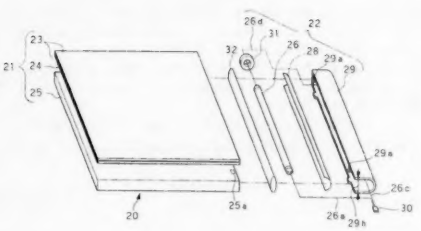
Mitsuhisa Nishimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 15, 1999, Appl. No. 333,885

Claims priority, application Japan, Jul. 1, 1998, 10-186115

Int. Cl. F21V *5/00*

U.S. Cl. 362—31 **6 Claims**



1. A liquid crystal display comprising:

a liquid crystal display section;

a light generating section having an irradiating tube for irradiating said display section;

fittings on said display section and on said light-generating section for detachably attaching said light-generating section to said display section;

at least one elastic member provided in said light-generating section, surrounding and supporting said irradiating tube;

a reflecting plate, positioned in the light-generating section and at an opposite side of a light-emitting side of the light-generating section, for reflecting light from the irradiating tube; and

a light-transmitting member, positioned at the light-emitting side of the light-generating section, for refracting and transmitting the light reflected by the reflecting plate, the light-transmitting member having a shape in which the display section is substantially uniformly irradiated by transmitted light through the light-transmitting member.

US 6,409,357 B1

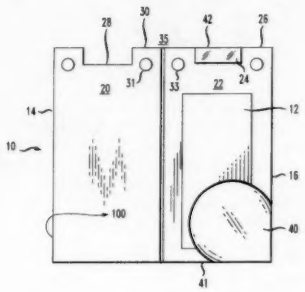
ILLUMINATED BILLFOLD, PORTFOLIO, BOOK AND THE LIKE

Roger R. Thompson, and Robin A. Thompson, both of 10 River View Pl., Sea Bright, N.J. 07760

Filed Jan. 12, 2001, Appl. No. 758,281

Int. Cl. A47B *19/00*

U.S. Cl. 362—98 **16 Claims**



1. The combination comprising:

a page of printed information content between front and back covers;

a first source of illumination affixed to at least one of said front and back covers adjacent an edge surface thereof;

a notch in the other of said front and back covers opposite said source of illumination, said notch being dimensioned to overlie said source of illumination and to allow said source of illumination to extend therethrough when closing said page substantially flat folding said covers atop one another;

and electronic switch means connected to said source of illumination for energizing said source to illuminate only when said front and back covers are folded away from one another; and

wherein said electronic switch means includes a battery and a position sensor in direct connection to automatically energize said source only in response to the folding away from each other of said front and back covers, wherein said battery is enclosed within one of said front and back covers, and wherein said position sensor includes cooperating parts affixed at opposing points on inside surfaces of each of said front and back covers, respectively.

US 6,409,358 B1

ILLUMINATED STOP SIGN

Michael W. Grover, 391-D N. Melrose Dr., Vista, Calif. 92083

Filed Jul. 7, 2000, Appl. No. 612,088

Int. Cl. F21V *33/00*

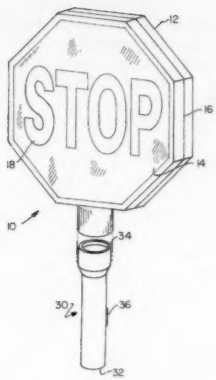
U.S. Cl. 362—109 **3 Claims**

1. An illuminated sign device, said device comprising:

a housing having a front side, a back side and peripheral wall extending between and integrally coupled to said front and back sides, each of said front and back sides resembling stop signs, said housing having a lumen therein, an opening extending into said peripheral wall and into said lumen, said opening being on a bottom edge of said housing, said housing comprising a generally translucent material;

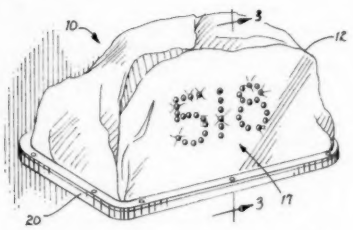
an elongate lighting device having a distal end and a proximal end, said elongate lighting device comprising a flashlight wherein light is emitted from said proximal end; and

a sleeve being securely attached to and extending away from an edge of said opening, said sleeve comprising an elastomeric



material, said proximal end of said flashlight being adapted for removably extending into said sleeve.

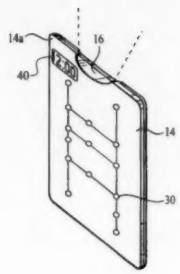
US 6,409,359 B1
LIGHTED ROCK AND METHOD THEREFOR
Robert G. O'Connell, 10117 E. Morning Star Dr., Scottsdale, Ariz. 85259
Filed Jul. 10, 2000, Appl. No. 613,198
Int. Cl. F21S *8/00*
U.S. Cl. 362—145 **16 Claims**



1. An illuminated artificial rock comprising, in combination:
an artificial rock having an exterior surface and a hollow interior area;
a street number formed of a plurality of openings extending through a front portion of said exterior surface and into said hollow interior area; and
a light positioned within said hollow interior area and oriented to transmit light toward said front portion of said exterior surface and through said plurality of openings so as to illuminate said street number and thus cause said street number to be visible to a person positioned opposite said front portion of said exterior surface.

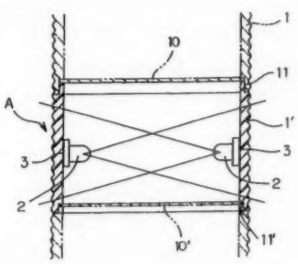
US 6,409,360 B2
METRO CARD HOLDER, MAP, LIGHT AND CLOCK
Patricia Anne Contant, 93-19 215th St., Queens Village, N.Y. 11428, and Dahved Levy Devonish, 166 Dekalb Ave., Brooklyn, N.Y. 11217
Continuation-in-part of application No. 09/551,773, filed on Apr. 18, 2000, now abandoned. This application Jan. 12, 2001, Appl. No. 759,090.
Int. Cl. F21V *33/00;* **F21L** *4/00*
U.S. Cl. 362—154 **4 Claims**

1. A card holder for receiving and storing a card and a transportation map comprising:



a) a first side;
b) a second side joined to said first side to form a substantially rectangular sleeve, said second side further comprising a digital clock having an action timer button;
c) a planar flashlight disposed within said substantially rectangular sleeve;
d) a first pocket disposed on said first side for receiving the card; and
e) a second pocket disposed on said second side for receiving the transportation map,
wherein said digital clock is connected to said planar flashlight such that said digital clock is illuminated when said activation button is pressed.

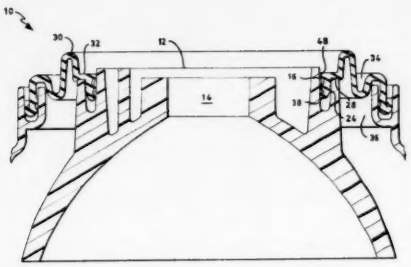
US 6,409,361 B1
LIGHT-EMITTING DIODE INDICATOR LAMP
Akito Ikeda, Yao, Japan, assignor to Patlite Corporation, Osaka, Japan
Filed Mar. 20, 2000, Appl. No. 528,503
Claims priority, application Japan, Mar. 19, 1999, 11-076110
Int. Cl. F21V *3/00*
U.S. Cl. 362—240 **15 Claims**



1. A light-emitting diode indicator lamp comprising at least one globe and a light emitting diode installed in said globe as a light source, wherein a plurality of said light-emitting diodes are disposed at prescribed intervals on an inner circumference of said globe facing radially inwardly so that said light-emitting diodes provide a diffusing light toward areas that face said light-emitting diodes.

US 6,409,362 B1
VEHICLE LAMP BOOT
Andrew J. Lundberg, Stanwood, Wash., and Christopher E. Swygart, North Vernon, Ind., assignors to Valeo Sylvania LLC, Seymour, Ind.
Filed Dec. 6, 2000, Appl. No. 731,085
Int. Cl. B60Q *1/00*
U.S. Cl. 362—267 **8 Claims**

1. A vehicle lamp boot assembly comprising:



a) a lamp housing with an exterior sidewall and an interior sidewall, the exterior sidewall and the interior sidewall extending in similar patterns offset one from the other to define therebetween a connected groove wherein the exterior sidewall has a height measured from a bottom of the groove that is greater than the height of the interior sidewall, and

b) a flexible boot with a barrier wall and a lip edge, the lip edge circumferentially conforms to the defined groove and is positioned in the defined groove, and the barrier wall is positioned adjacent the interior sidewall portion of the housing.

US 6,409,363 B1

CONTROL AND SIGNALING DEVICE OR SIGNALING DEVICE WITH A LUMINOUS ELEMENT

Bernd Wolff, Hennef; Joerg Schaefer, Rheinbach; Juergen Volberg, Troisdorf, and Juergen Hoegener, Niederkassel, all of Germany, assignors to Moeller GmbH, Bonn, Germany

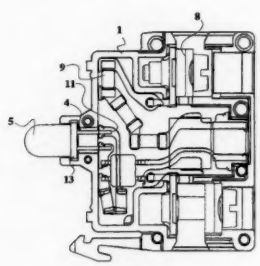
PCT No. PCT/EP00/01462, § 371 Date Oct. 25, 2000, § 102(e) Date Oct. 25, 2000, PCT Pub. No. WO00/52383, PCT Pub. Date Sep. 8, 2000

PCT Filed Feb. 23, 2000, Appl. No. 674,088

Claims priority, application Germany, Feb. 27, 1999, 199 08 574

Int. Cl. B60Q *3/04*

U.S. Cl. 362—362 **6 Claims**



1. A control and signaling unit or signaling unit including comprising:

a functional element including a housing half, a plurality of circuit conductors being disposed on an inner housing wall of the housing half so as to form an electronic circuit, the plurality of circuit conductors having been applied using a foil heat embossing process; and

only one light emitting diode having an angle of radiation of 30–45° and a luminosity of at least 0.5 candela disposed in a receptacle of the functional element, the diode including a diode crown and connecting wires.

US 6,409,364 B1

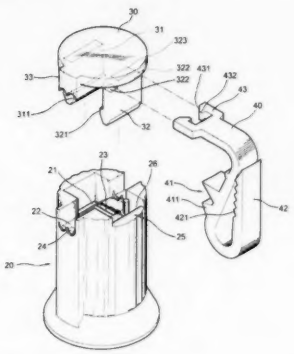
FASTENING DEVICE FOR CHRISTMAS LIGHT

Mei-Lu Lin, P.O. Box 697, Feng-Yuan City 420, Taiwan

Filed Jun. 14, 2000, Appl. No. 595,393

Int. Cl. F21V *21/00*

U.S. Cl. 362—391 **2 Claims**



1. A fastening device for a Christmas light comprising:

a socket having a bottom, a pair of retaining holes symmetrically formed in the bottom, a wire slot radially formed across the bottom including two recesses therein for receiving a pair of tip points for a pair of conductor plates and a notch formed in a circumferential wall of the bottom abutting one of the retaining holes;

a cap having a circular body, a pair of first and second projections symmetrically projecting downward from an underside of the body engaged into the retaining holes of the socket and each including a barb end engaged with an inner surface of the bottom of the socket, said second projection having a pair of indentations symmetrically formed in root thereof defining a narrow portion therebetween facing the notch of the socket;

a separating fastener having a L-shaped body, a jaw member at a first end of the L-shaped for engaging the fastener with the socket including a pair of elastic noses engaged with the indentations of the cap through the notch of the socket, each nose having a bevel end engaged with an inner surface of the narrow portion of the second projection, a first clip defined between the socket and a lower portion of the L-shaped body and a second clip defined by an extension extending upward from a lower end of the first clip having a bevel upper end engageable with an outer surface of the first clip.

US 6,409,365 B1

HANGING-TYPE DETACHABLE LAMP SHADE AND LIGHT BULB SOCKET ASSEMBLY STRUCTURE

Shih-Ming Lin, No. 132, Hsi Hsin Street, Chang Ya Tsun, Hsiu Shui Hsiang, Chang Hua Hsien, Taiwan

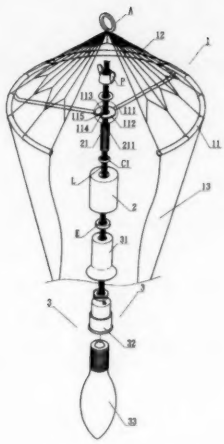
Filed Jun. 5, 2001, Appl. No. 873,324

Int. Cl. F21S *8/06*

U.S. Cl. 362—404 **5 Claims**

5. A hanging-type detachable lamp shade and light bulb socket assembly structure comprised of a hanging-type lamp shade, an insulator sleeve situated at the bottom section of the lamp shade, and a light bulb unit positioned inside the insulator sleeve; a center ring is formed away from the circumferential edge and towards the mid-diameter point of a top wire of said lamp shade and, furthermore, a power cord is situated at the top end of the said light bulb unit which is suspended from the power cord and said insulator sleeve is mounted on the center ring of said lamp shade; the innovations of which include:

the said top wire center ring has a through-hole in the middle and an opening formed towards its circumferential edge to provide for the insertion of said power cord and, furthermore,



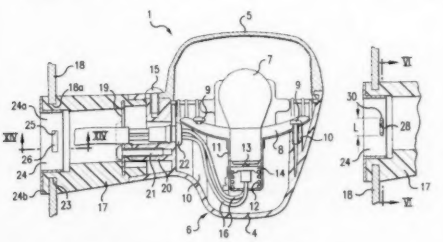
a collar projects downward vertically from the annular edge of said through-hole of the said center ring and the said collar is situated around the periphery of a threaded rod of said light bulb unit;

the said insulator sleeve has inserted at its center said threaded rod, which has a passage disposed through it; the bottom end of said threaded rod respectively extends into the interior section of a heat sink jacket between said insulator sleeve and said light bulb unit and is fastened to the bottom end of said heat sink jacket by a nut, said nut fastening said components into a single structural entity with a light bulb cap;

the said light bulb unit is situated in the said heat sink jacket within the interior section of said insulator sleeve and consists of the said light bulb cap fastened inside said heat sink jacket and a light bulb situated at the bottom end of said light bulb cap; a washer is placed in between the said heat sink jacket and said insulator sleeve, leaving an intervening space separating said two components:

as such, light bulb temperature is reduced and high-temperature contact between the said lamp shade and said light bulb that causes surface blackening or burning is prevented.

US 6,409,366 B1
LIGHTING DEVICE FOR A MOTORCYCLE
Tetsuya Kondo, and Takao Yamamoto, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 24, 1999, Appl. No. 448,305
Claims priority, application Japan, Nov. 27, 1998, 10-336903
Int. Cl. B62J *6/00*
U.S. Cl. 362—473 **11 Claims**



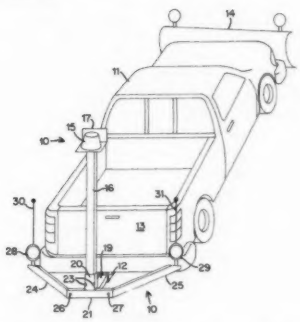
1. A lighting device for a vehicle having a mounting member, the device comprising:

a bulb container;

a stay for mounting the bulb container to the mounting member, the stay having a groove, and being connected to the bulb container, wherein the groove is engageable with a peripheral edge of the mounting member; and

a fixing member, the fixing member having a cylindrical portion and a flange extending radially from the cylindrical portion, the cylindrical portion of the fixing member extending into a through hole of the stay.

US 6,409,367 B1
REAR-MOUNTED VEHICLE LIGHTING SYSTEM
Richard Pratt, 332 New Portland Rd., Gorham, Me. 04038
Filed Jul. 6, 2000, Appl. No. 612,335
Int. Cl. F21V *101/14*
U.S. Cl. 362—505 **9 Claims**



1. A rear-mounted warning-light system for deployment on the rear of a vehicle, the system comprising:

a. a coupling member adapted to be removably coupled to the rear of the vehicle;

b. a beacon mount member attached to said coupling member;

c. a beacon mount leg pivotally coupled to said beacon mount member such that said beacon mount leg may be pivoted to a first position in which it extends upwards from said beacon mount member, and a second position in which it extends away from the rear of the vehicle while said coupling member remains coupled to the vehicle, said beacon mount leg having a lower portion pivotally coupled to said beacon mount member and an upper portion;

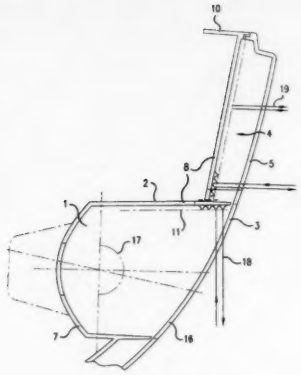
d. a warning beacon connected to said upper portion of said beacon mount leg; and

e. a first mount extension and a second mount extension connected to said beacon mount member and designed to extend from a central area of the rear of the vehicle outwardly toward the respective sides of the vehicle, wherein said first mount extension includes a first rear-facing light affixed to an end thereof adjacent to a first side of the vehicle and wherein said second mount extension includes a second rear-facing light affixed to an end thereof adjacent to a second side of the vehicle.

US 6,409,368 B1
LIGHTING DEVICE FOR VEHICLES
Klaus Henneboehle, Bueren-Steinhausen, and Heinz-Albert Puettmann, Hamm, both of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Germany
Filed Oct. 2, 2000, Appl. No. 676,510
Claims priority, application Germany, Sep. 30, 1999, 199 46 850
Int. Cl. B60Q *1/26;* **F21V** *7/04*
U.S. Cl. 362—517 **13 Claims**

13. A lighting device for a vehicle comprising:

a light housing;



a transparent cover enclosing said light housing, said transparent cover having at least one non-optic smooth surface;

a rear reflector having a first side, wherein said rear reflector is arranged within said light housing and said transparent cover;

a plurality of optical elements forming an optical surface, said optical surface arranged on said rear reflector, wherein said optical elements are positioned orthogonal to one another; and

a reflective layer applied to said optical surface, said optical surface reflecting light in a incident direction.

US 6,409,369 B1

DUAL FUNCTION HEADLIGHT FOR A MOTOR VEHICLE WITH A SINGLE LIGHT SOURCE AND FIXED OPTICS

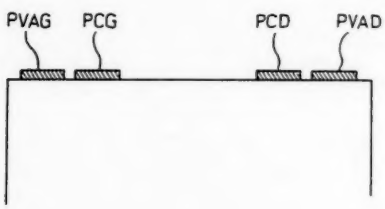
Antoine De Lamberterie, Paris, France, assignor to Valeo Vision, Bobigny, Cedex, France

Filed Apr. 27, 2000, Appl. No. 559,979

Claims priority, application France, Apr. 29, 1999, 99 05455

Int. Cl. F21V *7/00*

U.S. Cl. 362—518 **10 Claims**



1. A headlight for a motor vehicle for traveling on a road defining an axis of the road, the travel of the vehicle being generally in a direction along the axis of the road, wherein the headlight comprises a light source which cooperates with an optical means to produce a fixed beam which is generally spread widthwise with a specific cut-off and adapted for selective enhancement of a dipped passing beam produced by another headlight and to produce a fog penetrating beam, said fixed beam has at least two regions which are bounded by at least two sections of a top cut-off line which are disposed at different heights, a first region of the fixed beam is situated in line with the axis of the road, and is bound by at least a first section of the cut-off line, and a second region of the fixed beam is situated laterally with respect to the first region and is bounded by a second section of the cut-off line which is at a higher level than said first section of the cut-off line.

US 6,409,370 B1

VEHICULAR LAMP LENS HAVING AN INDENTED FRONT SURFACE

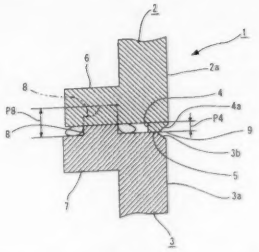
Kazuo Akiyama; Fujihiko Sugiyama, and Masahiko Nishizaki, all of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Feb. 22, 2000, Appl. No. 507,684

Claims priority, application Japan, Feb. 22, 1999, 11-042781

Int. Cl. F21Q *1/00*

U.S. Cl. 362—520 **13 Claims**



1. A vehicular lamp lens, wherein at least two lens members are integrated together, the lens members each having a front surface, the front surfaces being joined together at a boundary between the lens members, wherein:

the front surface of at least one of the lens members is displaced in the rearward direction as the front surface becomes closer to the boundary between the at least one lens member and another one of the lens members to which the at least one lens member is integrated, and

the displaced front surface of the at least one lens member forms an indentation.

US 6,409,371 B2

VEHICLE LAMP

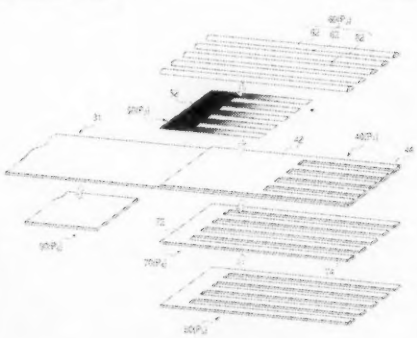
Shinji Aikawa, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 31, 2001, Appl. No. 919,010

Claims priority, application Japan, Aug. 2, 2000, 2000-233969

Int. Cl. F21V *5/00*

U.S. Cl. 362—520 **10 Claims**

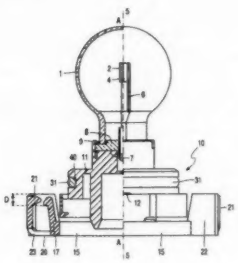


1. A vehicle lamp in which a lamp chamber is defined by a lamp body and a colorless transparent front lens mounted in a front opening of said lamp body, in which a light source is disposed in said lamp chamber, and in which a printed sheet is disposed inwardly of said front lens, said printed sheet comprising:

a sheet main body of colorless synthetic resin having a colored transparent layer printed in a predetermined pattern on a surface of said sheet main body;

a convex three-dimensional colorless transparent layer;
a plating-like printed layer; and
a light shielding layer,
wherein said colored transparent layer as a lower layer and said convex three-dimensional colorless transparent layer as an upper layer are formed in a laminated fashion on at least a part of an external surface of said sheet main body of said printed sheet, and
wherein said plating-like printed layer as a lower layer and said light shielding layer as an upper layer are formed in a laminated fashion on an internal surface of said sheet main body at a location matching the location of said convex three-dimensional colorless transparent layer.

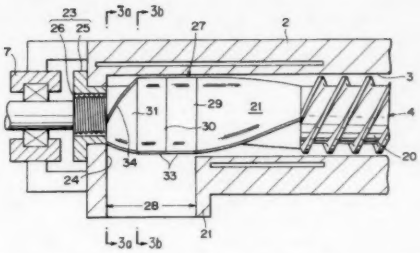
US 6,409,372 B1
CAPPED ELECTRIC LAMP
Ralph Hubert Peters, Maastricht; Hendrikus Albertus Maria Van Dulmen, and Wilhelmus Johannes Maria Manders, both of Eindhoven, all of Netherlands, assignors to Koninklijke Philips Electronics N.V., Netherlands
Filed May 30, 2000, Appl. No. 583,029
Claims priority, application European Pat. Off., Jun. 1, 1999, 99201732
This patent is subject to a terminal disclaimer.
Int. Cl. F21V *7/04*
U.S. Cl. 362—549 **28 Claims**



1. A capped electric lamp provided with:
a light-transmitting lamp vessel which is closed in a gastight manner, which has an axis, and in which an electric element is arranged having a center and connected to current conductors which issue from the lamp vessel to the exterior;
a lamp cap connected to the lamp vessel, which lamp cap comprises a housing;
said housing being provided with:
contact members which are connected to the current conductors;
at least a reference means;
at least a locking means for locking the connection between the lamp vessel and the lamp cap; and
at least a pair of coupling means,
wherein the pair of coupling means forms an integral whole with the housing in that they share an integral, resilient intermediate portion located between the pair of coupling means.

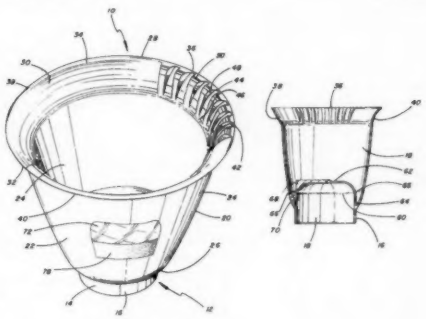
US 6,409,373 B1
CONTINUOUS KNEADER, ROTOR FOR MATERIAL DISCHARGING
Tatsuya Tanaka; Katsunori Takahashi; Masahiko Kashiwa; Yoshinori Kuroda, and Shigehiro Kasai, all of Takasago, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan
Filed May 26, 1999, Appl. No. 318,723
Claims priority, application Japan, May 27, 1998, 10-146066
Int. Cl. B01F *7/08;* **B29B** *7/46*
U.S. Cl. 366—84 **6 Claims**

1. A continuous kneader, comprising:



a kneader body having a chamber and a radial discharge port defining a discharge area;
a rotor in said chamber and having a feed section for feeding a material to be kneaded in a downstream direction to a kneading section, said kneading section being contiguous to said discharge area and being provided for melting and kneading said material to be kneaded into a kneaded material; and
said kneader further having a discharge section disposed within said discharge area, in which the kneaded material is discharged with rotation of the rotor, said discharge section having a twist flight on an outer peripheral surface of at least a downstream most portion of said rotor in said chamber, said twist flight being within said discharge area and being inclined in a direction such that said kneaded material is advanced in the downstream direction, said discharge section further having a parallel flight located upstream of said twist flight.

US 6,409,374 B1
BEVERAGE TASTING VESSEL WITH AERATING RIDGES AND AGITATING RIBS
Boyd I. Willat, 9120 Oriole Way, Los Angeles, Calif. 90069
Filed Apr. 30, 2001, Appl. No. 846,140
Int. Cl. A47J *43/27*
U.S. Cl. 366—130 **20 Claims**



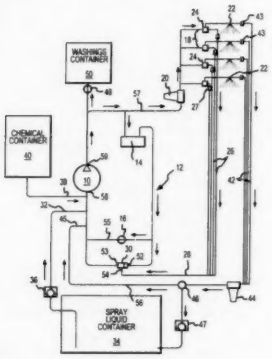
1. A unitary vessel comprising:
a bottom portion having an interior surface and an exterior surface;
a side wall extending upwardly and outwardly from the bottom portion, the side wall having an interior surface and an exterior surface, and the side wall terminating in an open top having an outwardly extending rim, wherein the rim comprises:
(a) a curved portion with a plurality of radially extending ridges,
(b) an angled edge portion, and
(c) a curved pouting lip portion;
a raised portion formed in the bottom portion of the vessel and projecting upwardly into the interior of the vessel;
a platform portion formed on the raised portion; and,

at least one radially projecting rib integral with the interior surface of the side wall and positioned opposite the platform portion, wherein the platform portion and the rib are designed to maximize the mixing of a liquid inside the vessel.

US 6,409,375 B1
PRECISION INJECTED LIQUID CHEMICAL MIXING APPARATUS

Brian George Knight, Wireless Hill, South Luffenham, Oakham, Rutland LE15 8NF, United Kingdom

PCT No. PCT/GB99/00333, § 371 Date Sep. 27, 2000, § 102(e) Date Sep. 27, 2000, PCT Pub. No. WO99/39834, PCT Pub. Date Aug. 12, 1999
PCT Filed Feb. 2, 1999, Appl. No. 601,557
Claims priority, application United Kingdom, Feb. 4, 1998, 9802316
Int. Cl. B01F *5/00*
U.S. Cl. 366—136 **7 Claims**



1. Spray apparatus of the kind in which chemical to be sprayed is injected into spray liquid before the mixture of liquid and chemical is sprayed, comprising a closed loop circulating system having a pump with an inlet and an outlet, a loop line connecting the pump inlet and outlet, a spray nozzle connected to the loop line downstream of the pump via a spray line, a spray liquid inlet connected to the loop line upstream of the pump and downstream of the spray liquid inlet, a chemical injection system connected to the loop line upstream of the pump, a venturi device having an inlet and an outlet in the loop line, and having a suction or side port, a return line connected to the spray line at a position adjacent to the spray nozzle and connected to the suction port of the venturi device, an agitation line connected between the loop line downstream of the venturi device and the spray line adjacent the spray nozzle and valve means in the spray line directing liquid flow to the spray nozzle to cause reverse flow through the agitation line past the spray nozzle and through the return line.

US 6,409,376 B1
MIXER APPARATUS

William Knight, Tonnline Rd., Broadhead, Wis. 53520

Filed May 2, 2000, Appl. No. 562,167
Int. Cl. B01F *7/24;7/20*
U.S. Cl. 366—141 **41 Claims**

1. A mixer apparatus for mixing livestock feed, said apparatus comprising:

a container for the reception therein of the feed;

said container including:

a housing;

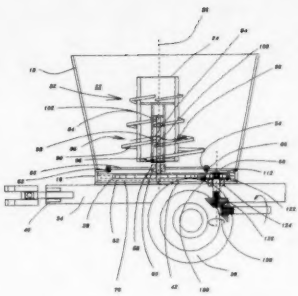
a wall extending away from said housing, such that substantially all of said wall is disposed above said housing, said wall defining an opening disposed above and remote from said housing for the reception therethrough of the feed, the arrangement being such that said housing and said wall define therebetween an enclosure for the feed received through said opening;

an auger disposed within said enclosure, said auger having an axis of rotation extending substantially vertically through said housing;

a substantially horizontally disposed drive pinion;

a final driven wheel driven by said drive pinion and disposed substantially horizontally within said housing, said pinion and final driven wheel intermeshing, said final driven wheel being rotatable about said axis of rotation, said final driven wheel being drivingly connected to said auger so that when said final driven wheel is rotated within said housing, said auger is rotated therewith within said enclosure for mixing the feed; and

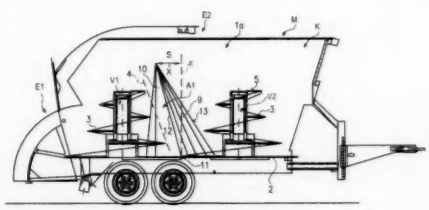
said final driven wheel and said auger together as a unit being removable in a first direction from said housing towards said opening and replaceable relative to said housing and enclosure respectively in a second direction from said opening towards said housing, said second direction being opposite to said first direction, the arrangement being such that when said final driven wheel and said auger are together as said unit removed, direct access to said final driven wheel is permitted.



US 6,409,377 B1
VERTICAL MIXING DEVICE FOR FODDER WITH INCLINED DISTRIBUTOR CONES

Nicolaas Van Der Plas, Oldenzaal, Netherlands, assignor to Trioliet Mullos B.V., Oldenzaal, Netherlands

Filed Mar. 27, 2001, Appl. No. 818,937
Claims priority, application Germany, Jul. 25, 2000, 200 12 862
Int. Cl. B01F *7/24*
U.S. Cl. 366—297 **11 Claims**



1. Vertical mixing device for fodder, comprising:

a mixing chamber at the bottom of which between substantially upright walls at least two vertical augers are provided in a longitudinal direction of said mixing chamber, which vertical augers are driven with the same sense of rotation for mixing and conveying fodder upwardly,

a distributor cone situated at each of said side walls in the wedge area between the rotational courses of both vertical augers, each distributor cone having guiding surfaces defining the surface of said distributor cone, said guiding surfaces extending from a cone bottom side base located in one of said wedge areas to an upper tip positioned at least close to a said side wall, each distributor cone being inclined obliquely to the corresponding one of said vertical augers, the rotational sense of which at the auger side of the said distributor cone is directed towards the said distributor cone.

US 6,409,378 B1

FILLER BODY WITH A CROSS CHANNEL STRUCTURE

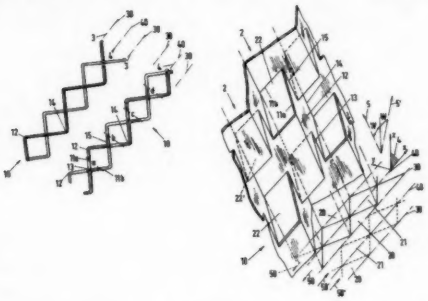
Alwin Kessler, Tuttwil, Switzerland, assignor to Sulzer Chemtech AG, Winterthur, Switzerland

Filed Jan. 25, 2000, Appl. No. 490,745

Claims priority, application European Pat. Off., Feb. 12, 1999, 99810130

Int. Cl. B01F *3/04;5/06*

U.S. Cl. 366—337 **10 Claims**



10. A mixer apparatus comprising a tube and a static mixer structure in the form of a filler body arranged in the tube, the filler body including a cross channel structure and comprising layers that border on one another, each layer including first channels that are arranged parallel to one another and lateral channels that are open to one another extending at boundary surfaces between adjacent layers, the lateral channels forming a cross-wise arrangement, wherein at least a portion of the layers contain central channels in addition to the lateral channels, and wherein boundaries between the central and the lateral channels are partially formed by wall sections, whereby the wall sections are approximately half as large as the whole surface of the boundaries, wherein the regularly arranged wall sections have free edges that are rectilinear and lie at least approximately on fall lines, wherein fall lines are defined as lying in a vertical plane and having a direction that is perpendicular to a horizontal line on the surface.

US 6,409,379 B1

SELF-WINDING WATCH

Jacques Gabathuler, Geneva; Cédric Jacot, Meyrin; Christophe Lyner, Fribourg, and David Nicolet, Prangins, all of Switzerland, assignors to Montres Rolex S.A., Geneva, Switzerland

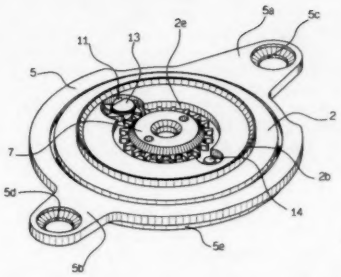
Filed Apr. 3, 2000, Appl. No. 542,077

Claims priority, application European Pat. Off., Apr. 23, 1999, 99810342

Int. Cl. G04B *3/12*

U.S. Cl. 368—150 **19 Claims**

1. A self-winding watch, said watch including a frame, comprising: a self-winding mass having a central part surrounded by raceways of a ball bearing, one of which is integral with said central part and another of which is integral with means for positioning and means for removably fastening to the watch frame,



a reduction gear train for connecting the self-winding mass to a barrel arbor and a reversing mechanism to convert the two-directional rotational movement of said self-winding mass into a one-directional rotational movement, transmitted to said barrel arbor, wherein two first pinions of said reversing mechanism are freely pivoted, concentrically with said central part, each of the first pinions meshing with a planet pinion, the pivot pin of which is integral with said central part and the toothing of which is shaped so as to allow only unidirectional rotations of s aid first pinions in two opposed respective directions of rotation, the first pinions being integral with two second respective moving parts of said gear train, the directions of rotation of which are opposite, one with respect to the other.

US 6,409,380 B1

DEW FORMATION PREDICTION METHOD AND APPARATUS, ENVIRONMENT AIR TEMPERATURE ESTIMATING METHOD AND APPARATUS AND RECORDING AND/OR REPRODUCING APPARATUS

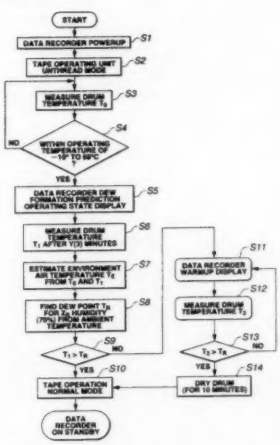
Seiichi Fukuzono, Kanagawa, and Kenichi Michitaka, Tokyo, both of Japan, assignors to Sony Precision Technology Inc., Tokyo, Japan

Filed Apr. 26, 2000, Appl. No. 558,737

Claims priority, application Japan, Apr. 27, 1999, 11-120245

Int. Cl. G01N *25/66;25/12*

U.S. Cl. 374—28 **9 Claims**



1. A dew formation prediction apparatus comprising:

object temperature detection means for detecting a temperature of an object provided in an electronic equipment;

environment air temperature acquiring means for acquiring an environment air temperature surrounding the electronic equipment;

means for acquiring a humidity of an operating environment around the electronic equipment;

dew point temperature calculating means for calculating a dew point temperature at the acquired humidity from said environment air temperature; and

dew formation occurrence verification means for verifying an occurrence of dew formation when the temperature of said object as acquired by said object temperature detection means is not higher than the calculated dew point temperature.

US 6,409,381 B1

RADIOGRAPHY DEVICE WITH OPERATING CONTROLS LOCATED AT THE X-RAY SYSTEM SUPPORT MECHANISM

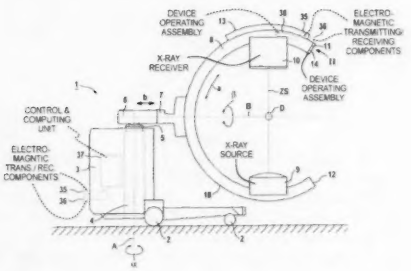
Rudolf Siebenhaar, Poxdorf, and Peter Noegel, Effeltrich, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 4, 2000, Appl. No. 477,384

Claims priority, application Germany, Jan. 11, 1999, 198 00 677; Nov. 29, 1999, 199 57 330

Int. Cl. H05G *1/02*

U.S. Cl. 378—197 **15 Claims**



1. A radiography device comprising:

a device component;

an X-ray source and an X-ray receiver;

a support mechanism having a C-arm on which said X-ray source and said X-ray receiver are mounted, said C-arm being connected to and displaceable relative to said device component, said C-arm having a perimeter; and

a device operating assembly mounted at said perimeter of said C-arm and being displaceable long said perimeter, said device operating assembly containing controls for at least one of displacing said C-arm and obtaining a radiographic exposure using said X-ray source and said X-ray receiver.

US 6,409,382 B1

MOBILE X-RAY APPARATUS

Koji Akutsu, Nara; Tatsuya Araki, Ohmihachiman; Kimihiro Takahama, Kyoto; Toshio Kadowaki, Kyoto, and Hajime Takemoto, Mukou, all of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Mar. 28, 2001, Appl. No. 818,578

Claims priority, application Japan, Mar. 28, 2000, 2000-087764; May 23, 2000, 2000-150755; Feb. 20, 2001, 2001-42631

Int. Cl. H05G *1/02*

U.S. Cl. 378—198 **23 Claims**

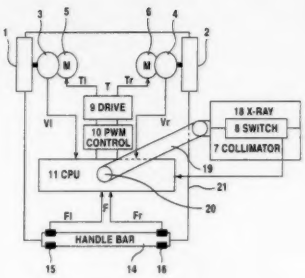
1. A mobile X-ray apparatus for a circuit examination comprising:

an X-ray tube with a collimator;

a mobile base having a pair of driven wheels;

a holder attached and movable to said base, said holder holding said X-ray tube;

a motor driver disposed in said base, driving said wheels;



an operation handle bar disposed in said base, providing a signal for driving said motor driver at a first speed;

an input means, separated from said handle bar, for providing a signal for driving said motor driver at a second speed being less than the first speed;

a controller for controlling said motor driver respectively according to said signal from said handle bar or said input means.

US 6,409,383 B1

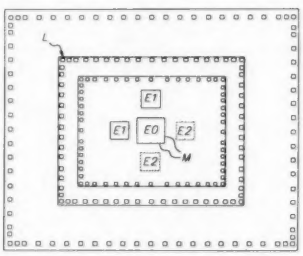
AUTOMATED AND QUANTITATIVE METHOD FOR QUALITY ASSURANCE OF DIGITAL RADIOGRAPHY IMAGING SYSTEMS

Xiaohui Wang, Pittsford, N.Y.; Richard L. Vanmetter, Washington, D.C.; David L. Foos, and David J. Steklenski, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 14, 2000, Appl. No. 525,089

Int. Cl. G01D *18/00*

U.S. Cl. 378—207 **15 Claims**



1. A phantom for use in measuring characteristics of a digital radiography image system comprising:

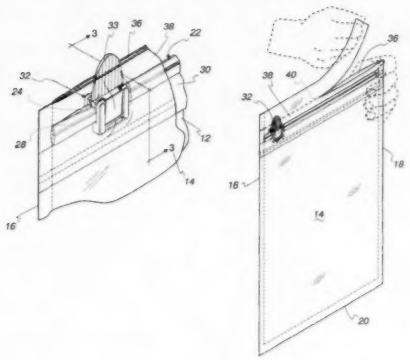
a substantially flat member of an x-ray attenuating material;

a first array of landmarks associated with said member to be imaged within but close to the boundary of the image receptor and to be used for use in geometry measurements including pixel size, pixel aspect ratio and scan linearity;

a set of regions associated with the central position of said member for exposure linearity accuracy and noise measurement; and

a set of sharp angular edges associated with the central position of said member for modulation transfer function measurements.

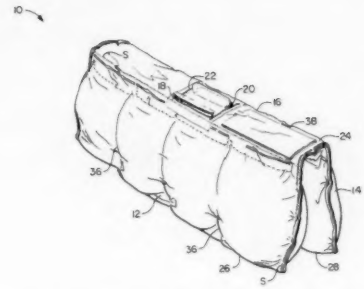
US 6,409,384 B1
ZIPPER SLIDER WITH GRAB TAB
Alexander R. Provan, Canandaigua; Thomas L. Coomber, Palmyra, and Toby R. Thomas, Victor, all of N.Y., assignors to Pactiv Corporation, Lake Forest, Ill.
Filed Aug. 10, 2000, Appl. No. 636,195
Int. Cl. B65D *33/34*
U.S. Cl. 383—5 **13 Claims**



1. A reclosable plastic bag, comprising:
first and second opposing body panels joined to each other along a pair of sides and a bottom bridging said pair of sides;
a zipper extending along a mouth formed opposite said bottom;
a slider slidably mounted to said zipper for opening and closing said zipper;
a grab tab extending upward from said slider and adapted to be grasped by a user for effectuating movement of said slider along said zipper;
first and second upstanding panels extending upwardly from respective said first and second body panels and being joined to each other to encapsulate said slider and said grab tab in a pocket, said first and second upstanding panels including one or more breakable lines of weakness for gaining access into said pocket, said grab tab extending above one or more of said breakable lines of weakness.

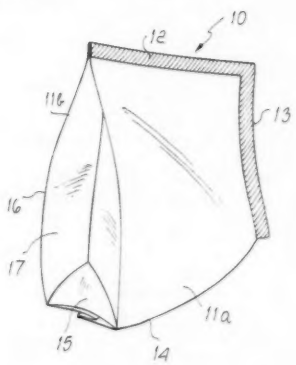
US 6,409,385 B1
APPARATUS AND METHOD FOR PACKAGING ARTICLES THEREIN
John F. Gee, Durham, N.C., assignor to Aventis CropScience S.A., Lyons, Cedex, France
Division of application No. 09/091,905, filed as application No. PCT/US96/20615, filed on Dec. 24, 1996, now Pat. No. 6,155,714, Provisional application No. 60/009,423, filed on Dec. 27, 1995. This application Nov. 21, 2000, Appl. No. 717,989.
Int. Cl. B65D *30/22;33/08*
U.S. Cl. 383—10 **17 Claims**

1. A plastic packaging apparatus for transporting an article comprising:
(a) a plurality of flexible, independent and separately sealable compartments for containing the article therein;
(b) a center section interconnecting said plurality of compartments, said center section constructed of a higher tensile strength plastic than each of said plurality of compartments;
(c) at least one separately sealable center compartment defined within said center section for containing the article therein; and



(d) a handle defined within said center section for gripping and carrying said packaging apparatus.

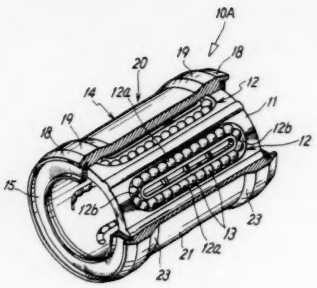
US 6,409,386 B1
CONTAINER MADE OF FLEXIBLE MATERIAL, PARTICULARLY FOR LIQUIDS
Giorgio Trani, and Marion Sterner, both of Venice, Italy, assignors to BP Europack S.p.A., Lugo di Vicenza, Italy
Filed Jun. 8, 2001, Appl. No. 877,677
Int. Cl. B65D *30/20*
U.S. Cl. 383—120 **5 Claims**



1. A container made of flexible material, particularly for liquids or fluids, being made of a single sheet of flexible material which is folded so as to form two mutually opposite quadrangular faces directly sealed along two consecutive sides and connected along the two further sides by accordion-like portions obtained by folding said sheet, a first accordion-like portion forming, on a third side, a substantially triangular base, a second accordion-like portion forming a closure wall on a fourth side, a closable opening for filling said container being provided.

US 6,409,387 B1
BALL BUSHING
Isao Yokohari, Ibaraki, Japan, assignor to SMC Corporation, Tokyo, Japan
Filed Sep. 25, 2000, Appl. No. 668,362
Claims priority, application Japan, Oct. 18, 1999, 11-295972
Int. Cl. F16C *29/06*
U.S. Cl. 384—43 **5 Claims**

1. A ball bushing comprising a cylindrical retainer into which a rod for carrying out a linear motion or a rotational motion can be inserted, a plurality of balls respectively housed for rolling in a plurality of annular grooves cut in said retainer and in rolling



contact with said rod, and an outer tube fitted on an outer face of said retainer for retaining said balls from outside, said ball bushing being used in a press-fitted state in a bearing hole of a machine having said rod, wherein

said outer tube has tapered portions inclined such that diameters of said tapered portions reduce as said tapered portions extend outward respectively at axial opposite end portions of an outer peripheral face, fixed portions having uniform outer diameters and pressed against and fixed to a hole face of said bearing hole respectively in positions adjacent to said tapered portions on insides of said tapered portions, and a smaller-diameter portion having an outer diameter smaller than that of said fixed portions at at least a portion of a tube intermediate portion positioned between said two fixed portions.

US 6,409,388 B1

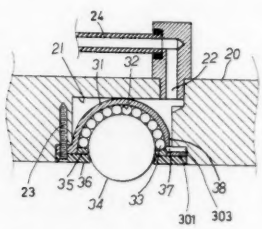
BALL SUPPORT HAVING A CLEANING STRUCTURE

Chuan Duo Lin, 7F, No. 46, Pin Ho 10 Street, Chang Hua, Taiwan, 500

Filed Dec. 29, 2000, Appl. No. 754,789

Int. Cl. F16C *29/04;* **B60G** *13/00;* **B60B** *33/08*

U.S. Cl. 384—49 **7 Claims**



1. A ball support comprising:

a cup including a peripheral portion having a peripheral flange laterally extended outward therefrom, and including a chamber formed therein, and including a passage formed through said cup and communicating with said chamber of said cup, and including an outer peripheral portion having a cut-off portion formed therein and communicating with said passage of said cup,

a rotary member received in said chamber of said cup,

a plurality of balls received in said chamber of said cup and engaged between said rotary member and said cup, and

means for retaining said rotary member and said balls in said cup,

said passage and said cut-off portion of said cup being communicating with said chamber of said cup for allowing a cleaning agent to flow into said chamber of said cup to clean said ball support.

US 6,409,389 B1

HYDRODYNAMIC BEARING STRUCTURE, HYDRODYNAMIC BEARING APPARATUS, METHOD OF PRODUCING HYDRODYNAMIC BEARING APPARATUS, AND DEFLECTION SCANNING APPARATUS USING HYDRODYNAMIC BEARING APPARATUS

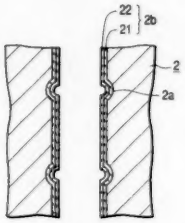
Susumu Kadokura, Sagamihara; Takamichi Ishino, Edosaki-machi, and Masayoshi Asami, Funabashi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 2000, Appl. No. 553,855

Claims priority, application Japan, Apr. 22, 1999, 11-114341; Apr. 20, 2000, 2000-118852

Int. Cl. F16C *32/06*

U.S. Cl. 384—100 **69 Claims**



1. A hydrodynamic bearing structure comprising:

a sleeve; and a rod-like shaft fitted in the sleeve;

wherein at least one of the sleeve and the rod-like shaft is rotatable,

wherein a fit surface of at least one of the sleeve and the rod-like shaft has an electrodeposition film comprised of a resin consisting of a polymer having 10,000 or more repeating units; and

wherein at least one of the sleeve and the rod-like shaft is provided with a hydrodynamic groove pattern consisting of a plurality of grooves.

US 6,409,390 B1

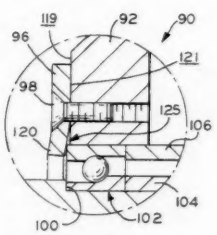
COMPACT, PRECISION DUPLEX BEARING MOUNT FOR HIGH VIBRATION ENVIRONMENTS

George Elias Bouzakis; James Edward Bowman, both of Fort Wayne, Ind.; Edward J. Devine, Laurel, Md.; Benjamin Joffe, Fort Wayne, Ind.; Kenneth Neal Segal, Ellicott City, Md., and Merritt J. Webb, Fort Wayne, Ind., assignors to ITT Manufacturing Enterprises, Inc., Wilmington, Del.

Filed Oct. 31, 2000, Appl. No. 702,510

Int. Cl. F16C *33/58*

U.S. Cl. 384—517 **20 Claims**



1. A duplex bearing mount comprising:

at least one duplex bearing having an inner race and an outer race, said inner race disposed within said outer race and being rotatable relative to said outer race about an axis, said inner race having substantially no relative movement relative to said outer race in at least one direction along said axis, said

inner and outer races each having first and second axial faces which are respectively located at the same axial end of said duplex bearing;

a housing, said duplex bearing radially supported by said housing;

a shaft which extends through said inner race, said shaft radially and axially supported by said inner race;

a first retainer connected to said housing and being engaged with the first axial surface of a bearing race, the movement of which race in a first direction along said axis being constrained by said first retainer;

a second, resilient retainer connected to one of said housing and said shaft and being deflected through engagement with the second axial face of a bearing race, the movement of which race in a second direction along said axis, opposite to said first direction, being constrained by said deflected second retainer;

wherein said bearing is preloaded by its being clamped between said first and second retainers, and said second retainer forms at least a portion of a spring having the characteristic of a substantially constant force value correlating to a range of various deflection values, whereby the preload of said bearing is substantially unaffected by variations in the deflection of said second retainer.

US 6,409,391 B1

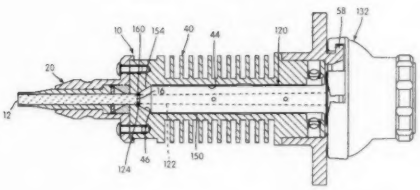
FIBER OPTIC ILLUMINATION ADAPTOR ASSEMBLY FOR MULTIPLE LIGHT GUIDE CONNECTORS

David D. Chang, Encino, Calif., assignor to Cogent Light Technologies, Inc., Santa Clarita, Calif.

Provisional application No. 60/126,335, filed on Mar. 26, 1999. This application Mar. 22, 2000, Appl. No. 532,300.

Int. Cl. G02B *6/36*

U.S. Cl. 385—53 **15 Claims**



1. An adaptor assembly for coupling light guide connectors of varying conjurations to a structure housing a source of focused light to be optically coupled into the light guide, said adaptor assembly including an internal adaptor comprising:

an internal optic guide element having an input end and an output end;

coupling structure constructed and arranged to be releasably coupled to the structure housing the source of focused light, said internal optic guide element being disposed within said coupling structure with said input end thereof being exposed at an end of said coupling structure;

a housing extending from said coupling structure, said housing including heat dissipating elements formed thereon and a connector-receiving channel formed therein, said channel extending from an opening formed at one end of said housing and terminating proximate said output end of said internal optic guide element and being constructed and arranged to receive a light guide connector inserted into said channel and to position the connector with respect to said output end of said internal optic guide element; and

a connector locking mechanism attached to said housing and constructed and arranged to operatively engage a light guide connector inserted into said channel and releasably hold said light guide connector within said channel.

US 6,409,392 B1

DUPLEX CLIP FOR CLIPPING TWO OPTICAL FIBER SIMPLEX CONNECTORS TOGETHER TO FORM A DUPLEX CONNECTOR

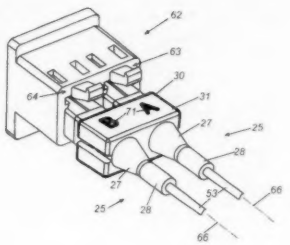
Norman Roger Lampert, Norcross; Elizabeth J. Driscoll, Atlanta, and Troy Barry Mock, Lawrenceville, all of Ga., assignors to Fitel USA Corp., Norcross, Ga.

Filed Oct. 19, 1999, Appl. No. 421,190

This patent is subject to a terminal disclaimer.

Int. Cl. G02B *6/38*

U.S. Cl. 385—56 **12 Claims**



1. A detachable duplex clip for clipping a pair of simplex connectors together to form a duplex connector, each simplex connector comprising a generally rectangular housing having a plug end for insertion into a mating receptacle or adapter, a cable entrance end for receiving a cable containing a transmission medium, and an individual independent boot attached at a first end of the boot about the cable entrance end and at a second end of the boot to the cable, the boot having an opening formed therein, the cable passing through the opening formed in the boot and into the cable entrance end of the housing, the clip comprising:

a clip body, the clip body being adapted to receive and frictionally grip outer surfaces of each of the boots of a pair of simplex connectors to hold the simplex connectors in close spatial proximity to one another to thereby form a duplex connector, said clip body being detachable from each of the individual boots.

US 6,409,393 B1

FIBER OPTIC CONNECTOR ASSEMBLY AND METHOD OF ASSEMBLY

Igor Grois, Northbrook, and B. Daniel Szilagyi, Downers Grove, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Feb. 18, 2000, Appl. No. 507,246

Int. Cl. G02B *3/36*

U.S. Cl. 385—78 **13 Claims**

1. A fiber optic connector assembly, comprising:

a ferrule terminated to at least one optical fiber;

a pin keeper engageable with a rear end of the ferrule;

at least one alignment pin extending from the pin keeper through the ferrule and projecting beyond a front end of the ferrule for operative association with a complementary connecting device;

a pusher member spaced behind the pin keeper; and

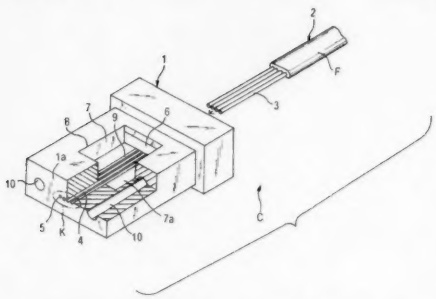
a spring sandwiched between the pusher member and the pin keeper, the spring being fixed to the pusher member to provide a self-contained subassembly comprising the spring and pusher member.

US 6,409,394 B1

OPTICAL CONNECTOR

Tomohiko Ueda; Kenichiro Ohtsuka, and Toshiaki Kakii, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 21, 2000, Appl. No. 531,506
Int. Cl. G02B *6/36*
U.S. Cl. 385—80 **4 Claims**



1. An optical connector comprising an optical fiber and a connector ferrule body for containing and holding an end portion of said optical fiber within an optical fiber positioning hole;

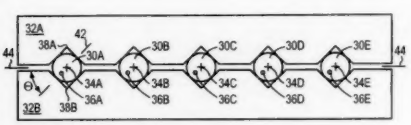
wherein an end face of said optical fiber is disposed within said optical fiber positioning hole, a part of said optical fiber with a predetermined length from the end face side thereof is held axially slidable within said optical fiber positioning hole, said optical fiber is secured by an area thereof subsequent to said predetermined length part to said connector ferrule body, and a refractive index matching material is filled said optical fiber positioning hole at least from a front end face of said connector ferrule body to the end face of said optical fiber, wherein an optical fiber alignment groove is disposed behind said optical fiber positioning hole in said connector ferrule body, said optical fiber being secured to said optical fiber alignment groove by bonding.

US 6,409,395 B1

METHOD FOR FABRICATING FIBER ARRAYS WITH PRECISION FIBER CORE-TO-CORE PITCH AND HEIGHT

Xiaomei Wang, Winchester, and Dale C. Flanders, Lexington, both of Mass., assignors to Axsun Technologies, Inc., Billerica, Mass.

Filed May 24, 2001, Appl. No. 864,501
Int. Cl. G02B *6/36*
U.S. Cl. 385—83 **28 Claims**



1. A fiber array comprising:

a bench including seats for receiving fibers; and

fibers mounted in the seats, the fibers comprising a fiber core and cladding surrounding the fiber core, each fiber having a core-to-clad offset axis defined between the fiber core center and the cladding center of each fiber, the fibers being mounted in the array such that the respective core-to-clad offset axes of the fibers are substantially parallel to each other.

US 6,409,396 B1

INTERFERENCE FILTER HAVING A GLASS SUBSTRATE

Alexander J. Marker, III, Moscow; Sally Pucilowski, Luzerne, and Joseph Hayden, Clarks Summit, all of Pa., assignors to Schott Glass Technologies, Inc., Duryea, Pa.

Provisional application No. 60/222,597, filed on Aug. 2, 2000. This application Jul. 30, 2001, Appl. No. 917,220.
Int. Cl. G02B *6/36;* **C03C** *3/16;4/10*
U.S. Cl. 385—88 **2 Claims**

1. A fiber optic system, comprising:

a light source;

a fiber optic transmission component;

a receiver or transmitter of radiation; and

an interference filter, comprising a glass substrate with at least two interference layers coated thereon; wherein the glass substrate comprises:

Oxide Weight Percent Based on Oxide
P_2O_5 30–70 Al_2O_3 5–15 R'O 5–15 R' = Mg, Ca, Sr, Ba, Zn, Pb R_2O R = Li, Na, K 15–40

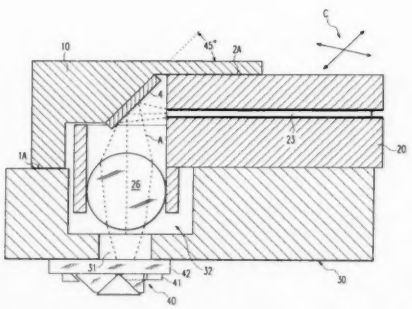
and wherein the glass substrate has a coefficient of thermal expansion of 130–210× 10^{-7}/° C. at 30° C. to 70° C.

US 6,409,397 B1

SURFACE-MOUNTED, FIBER-OPTIC TRANSMITTING OR RECEIVING COMPONENT HAVING A DEFLECTION RECEPTACLE WHICH CAN BE ADJUSTED DURING ASSEMBLY

Martin Weigert, Hardt, Germany, assignor to Infineon Technologies AG, Munich, Germany

Filed Oct. 2, 2000, Appl. No. 677,561
Claims priority, application Germany, Sep. 30, 1999, 199 47 113
Int. Cl. G02B *6/36*
U.S. Cl. 385—92 **10 Claims**



1. A surface-mounted, fiber-optic component, comprising:

a mounting platform having a recess formed therein, a first side and a second side with a planar surface;

a device having electrical connections and selected from the group consisting of transmitters and receivers, said device fixed on said first side of said mounting platform;

a beam deflection device mounted on said second side of said mounting platform, said beam deflection device having:

a first assembly being a right-angled bracket having limbs, a right angled region with a surface running obliquely between said limbs, and a deflection mirror being disposed on said surface; and

a second assembly with a fiber holding device, said fiber holding device having a side surface, two main surfaces including a first main surface and a second main surface opposite and parallel to one another, a bushing and an optical fiber routed in said bushing parallel to said main surfaces as far as said side surface, said first main surface of said fiber holding device mounted on said planar surface of said mounting platform;

one of said limbs of said first assembly having an inner surface resting on said second main surface of said fiber holding device such that said deflection mirror faces said side surface of said fiber holding device;

another of said limbs of said first assembly having an inner surface resting at right angles on said planar surface of said mounting platform such that said first assembly can be moved on said planar surface of said mounting platform during an assembly process, and is fixed in a desired position on said planar surface;

said first assembly and said second assembly can be adjusted relative to one another and fixed in a desired position during an assembly process; and

a mounting frame for housing said mounting platform and having external connecting pins and electrical bushings through which said electrical connections of said device are connected to said external connecting pins of said mounting frame.

US 6,409,398 B2

OPTICAL MODULE AND MANUFACTURING METHOD OF OPTICAL MODULE

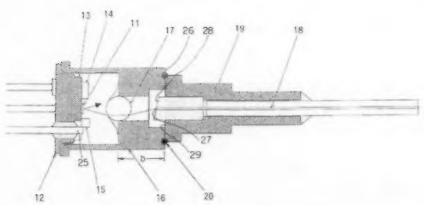
Susumu Nakaya, and Hideyuki Tanaka, both of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1998, Appl. No. 206,165

Claims priority, application Japan, Dec. 12, 1997, 9-341777; Sep. 30, 1998, 10-278087

Int. Cl. G02B *6/36*

U.S. Cl. 385—93 **21 Claims**



1. An optical module comprising:

a stem having an interconnection terminal;

a base bonded onto the stem by fitting the base and the stem into a predetermined guide hole of a coupling tool and heating the coupling tool so as to couple the base and the stem;

an optical device positioned on a surface of the base and electrically connected to the interconnection terminal;

a cap fixed onto the stem so as to enclose the optical device within the cap;

an optical fiber connected to the cap such that an end surface of the optical fiber projects into the cap along an optical axis so as to be optically coupled to the optical device; and

a lens for optically coupling the optical device with an optical member positioned outside the cap;

wherein the cap has a predetermined height so as to maintain a predetermined distance between the end surface of the optical fiber and the optical device.

US 6,409,399 B1

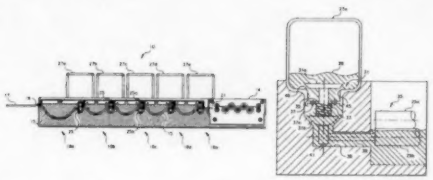
PHOTOGRAPHIC PROCESSOR HAVING A ROLLER CAM REPLENISHMENT SYSTEM

Kevin H. Blakely, Rochester; Ralph L. Piccinino, Jr., Rush, and Daniel M. Pagano, Honeoye Falls, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 21, 2000, Appl. No. 745,720

Int. Cl. G03D *13/00;3/02*

U.S. Cl. 396—567 **14 Claims**



13. A replenishment system for a photographic processor, the replenishment system comprising:

a chamber for holding a processing solution therein and a dispensing mechanism which dispenses the processing solution from said chamber in direct relationship with an amount of photosensitive media being processed in a photographic processor, said dispensing mechanism comprising a member which is adapted to open and close an opening in said chamber, said member being adapted to contact a cam roller whose rotation is based on a passage of photosensitive media in the processor, wherein the rotation of said cam roller moves said member to open and close the opening.

US 6,409,400 B1

IMAGE RECORDING APPARATUS, LIGHT-SENSITIVE MATERIAL PROCESSING APPARATUS AND IMAGE FORMING APPARATUS

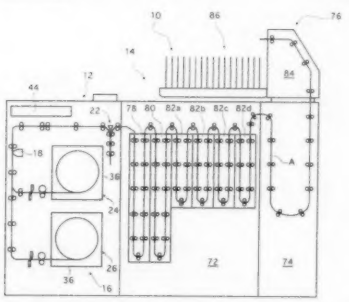
Haruhiko Arai, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 26, 1998, Appl. No. 178,474

Claims priority, application Japan, Oct. 24, 1997, 9-292583

Int. Cl. G03D *3/08;* **B65H** *29/00*

U.S. Cl. 396—612 **20 Claims**



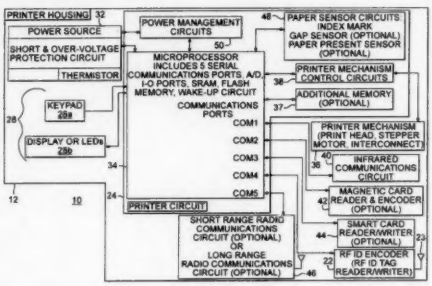
19. A light-sensitive material processing apparatus comprising;

a developer which performs a wet development process on an as-exposed light-sensitive material which is cut to a specified length and which has a latent image formed thereon by imagewise exposure;

a transport section which receives the as-exposed light-sensitive material supplied and for transporting the as-exposed light-sensitive material into the developing means; and

a reversing section which reverses the as-exposed light-sensitive material being transported such that an advancing end of said light-sensitive material in the direction of transport becomes a trailing end, said reversing section being located in said transport section.

US 6,409,401 B1
PORTABLE PRINTER WITH RFID ENCODER
Steven F. Petteruti; Majid Amani, both of East Greenwich, and Michael L. Lamontagne, Johnston, all of R.I., assignors to Zih Corp., Wilmington, Del.
Provisional application No. 60/193,282, filed on Mar. 30, 2000. This application Mar. 26, 2001, Appl. No. 817,529.
Int. Cl. B41J *3/36*
U.S. Cl. 400—88 **20 Claims**



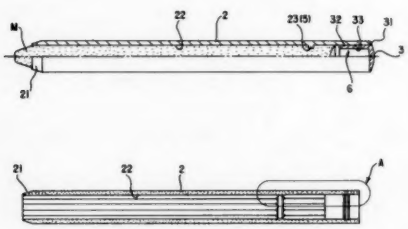
1. A portable printer for printing information on media comprising:

means for printing first information on media in which said media has at least one RFID circuit coupled thereto;

means for encoding second information onto said RFID circuit; and

a portable housing comprising at least said printing means and said encoding means, wherein said housing weighs less than two pounds.

US 6,409,402 B2
COSMETIC PENCIL
Yoshikazu Tani, and Arata Sasaki, both of Tokyo, Japan, assignors to Tokiwa Corporation, Gifu, Japan
Filed Feb. 14, 2001, Appl. No. 782,155
Claims priority, application Japan, Feb. 14, 2000, 2000-035739
Int. Cl. B43K *19/02;19/06;19/14*
U.S. Cl. 401—96 **6 Claims**



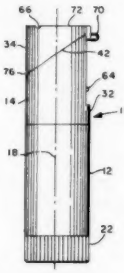
1. A cosmetic pencil comprising:

a transparent shaft body having a good cutting property is formed from a composite material of olefin-based polymer having polypropylene as a base material and a resin material consisting of one or more resins selected from the group of acrylic resin, ethylene vinyl acetate polymer, and styrene-based resin, the resin material being transparent and rigid;

a softened cosmetic material, the softened cosmetic material is filled and set in a shaft hole of said transparent shaft body, and a tip end side of said transparent shaft body is cut to use said cosmetic material; and

wherein the transparent shaft body comprises a moving prevention means within the shaft hole so that the softened cosmetic material is prevented from moving, and is formed integrally with the transparent shaft body by an injection molding means.

US 6,409,403 B1
GLUE STICK
Michael T. Woos, Bay Village, Ohio, assignor to Manco, Inc., Avon, Ohio
Filed Nov. 13, 2000, Appl. No. 711,477
Int. Cl. B43K *73/00*
U.S. Cl. 401—98 **10 Claims**



1. A glue stick product comprising:

a generally cylindrical housing having an axis and open top;

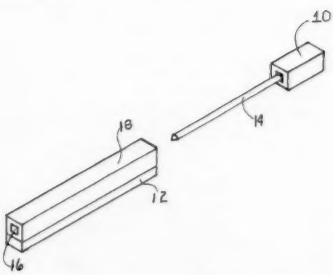
a body of solid glue having a top surface, said body of glue at least partially contained in said housing;

a mechanism adapted to urge said body of glue upwardly;

a cylindrical cap having an axis coincident with said housing axis adapted to engage said housing and close said top, said cap having an open bottom allowing said glue to enter said cap, a cylindrical side wall and a closed top, said cap being split into a lower portion and an upper portion at a plane intersecting said cap axis, said plane being other than perpendicular to said axis; and,

said upper portion being movable between an open position in which at least a portion of said upper portion is separated from said cap lower portion and said body of glue top surface is exposed and a closed position in which said upper portion joins said lower portion and encloses said body of glue top surface.

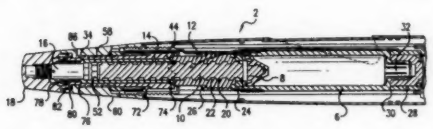
US 6,409,404 B1
MINIATURE PEN WITH HOLDER THAT HAS AN ADHESIVE MOUNTING STRIP
Michael Matthew Piech, 85 Densmore, Buffalo, N.Y. 14220
Provisional application No. 60/249,050, filed on Nov. 15, 2000. This application Oct. 29, 2001, Appl. No. 54,367.
Int. Cl. B43K *23/02*
U.S. Cl. 401—131 **6 Claims**



1. A writing instrument comprising:

a one-piece elongated tubular sheath formed from a tube having a constant cross-section and having first and second ends;
a writing cartridge having a writing end and an opposite end;
an end cap having a constant coss-section and having substantially the same cross-section as said elongated tubular sheath wherein said end cap is secured to said opposite end of said writing cartridge and has a length substantially less than a length of said elongated tubular sheath; and
a mounting strip secured along a length of said elongated tubular sheath and adapted to secure the writing instrument to a chosen surface wherein said writing cartridge is insertable into said first end of said elongated tubular sheath such that an end of said end cap abuts said first end of said elongated tubular sheath to thereby store said writing cartridge within said elongated tubular sheath.

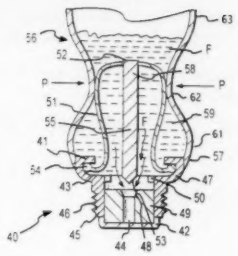
US 6,409,405 B1
FOUNTAIN PEN WITH LEAK PROOF PISTON CONVERTER
Ryan S. Eddington, Dallas City, Ill., assignor to BIC Corporation, Milford, Conn.
Filed Jan. 28, 2000, Appl. No. 493,921
Int. Cl. B43K *5/08*
U.S. Cl. 401—174 **19 Claims**



1. A piston converter for a fountain pen, said piston converter comprising:
a hollow body having a distal end and an opposite proximal end, wherein said distal end is configured to provide fluid communication between said hollow body and a nib of a fountain pen;
a plunger assembly with at least a plunger slidably disposed within said hollow body;
a control member having a distal end and an opposite proximal end, wherein said distal end of said control member is configured to engage said plunger assembly advance or withdraw said plunger within said hollow body;
a drive rod having a distal end and an opposite proximal end, wherein said distal end of said drive rod is configured to engage said proximal end of said control member;
an engagement rod having a first end and an engagement end, said engagement end being configured to selectively engage said drive rod and being moveable between an engaged position and an unengaged position, such that when in said engaged position turning said engagement rod will cause said drive rod to turn, which will cause said control member to advance or withdraw said plunger within said hollow body, and when in said unengaged position turning said engagement rod does not cause said drive rod to turn.

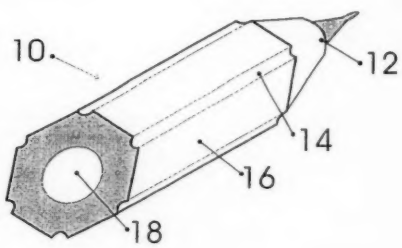
US 6,409,406 B1
VALVED FLUID APPLICATOR
Gilbert Schwartzman, 1025 Old White Plains Rd., Mamaroneck, N.Y. 10543
Filed Aug. 27, 2001, Appl. No. 938,639
Int. Cl. B43M *11/06*
U.S. Cl. 401—186 **20 Claims**

1. A fluid applicator comprising:
a flexible container having walls that form upper, lower and middle sections;
a discharge opening at an upper portion of said applicator adjacent to said upper section of said flexible container;



a fluid passage to said discharge opening;
a valve seat in said upper portion at an inner end of said fluid passage;
a valve means for contacting said valve seat to block said fluid passage;
said valve means including a rod having an upper end and a lower end;
said rod upper end having a valve and said rod lower end having resilient springs attached thereto;
said resilient springs having a lower end and an upper end;
said resilient springs lower end being attached to said rod lower end;
said resilient springs extending upwardly from said rod lower end with said springs upper ends connected to said flexible container upper section to resiliently hold said valve against said valve seat.

US 6,409,407 B1
PEN OR PENCIL
Manfred Schweizer, Eckental, Germany, assignor to Schwan-STABILO Schwanhausser GmbH & Co., Heroldsberg, Germany
PCT No. PCT/EP00/06574, § 371 Date Jul. 18, 2001, § 102(e) Date Jul. 18, 2001, PCT Pub. No. WO01/03946, PCT Pub. Date Jan. 18, 2001
PCT Filed Jul. 11, 2000, Appl. No. 889,544
Claims priority, application Germany, Jul. 12, 1999, 199 32 460
Int. Cl. B43K *5/12*
U.S. Cl. 401—192 **13 Claims**



1. A pen or pencil comprising a writing tip end a shaft (**10**) which in its peripheral surface has at least one first (**16**) and at least one second (**14**) surface region, characterized in that irradiation of the first surface region (**16**) with light of a first light quantity per unit of surface area results in an emission of visible light in the second surface region (**14**), wherein the light quantity emitted in the second surface region (**14**) per unit of surface area for at least one first frequency is greater than the light quantity per unit of surface area of the first frequency, which is absorbed in the first surface region (**16**).

US 6,409,408 B2

WRITING INSTRUMENT

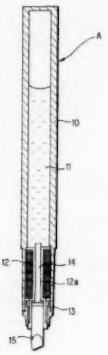
Takao Koyama, Ashikaga, Japan, assignor to Mitsubishi Pencil Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 2001, Appl. No. 771,053

Claims priority, application Japan, Feb. 4, 2000, 2000-027962

Int. Cl. B43K *5/00;* **A45D** *34/00*

U.S. Cl. 401—222 **11 Claims**



1. A free ink type writing instrument having an ink take part for storing an ink, wherein the whole or a part of an internal surface part in contact with the ink in the ink tank part has a smaller critical surface tension than a surface tension of the ink, and a contact angle between the ink and the whole or a part of the internal surface part in contact with the ink in the ink tank part is 30° or more at a temperature of 25° C.

US 6,409,409 B2

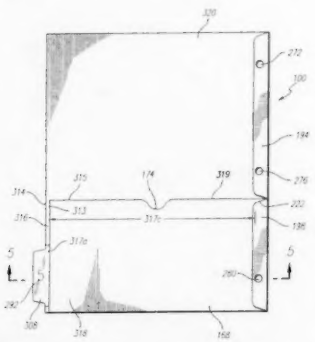
TABBED DIVIDER AND POCKET CONSTRUCTION

Bruce D. Bauman, Tustin; Andrew S. Gordon, Los Angeles, and Russ D. Pollman, Pomona, all of Calif., assignors to Avery Dennison Corporation, Pasadena, Calif.

Filed Dec. 15, 1998, Appl. No. 211,404

Int. Cl. B65D *27/00*

U.S. Cl. 402—79 **54 Claims**



1. A tabbed divider and pocket assembly, comprising:

a continuous sheet having a sheet body portion, a sheet tab portion extending out from a side edge of the sheet body portion and a sheet pocket panel at a bottom edge of the sheet body portion;

the sheet pocket panel is in a folded-up position and attached along side edges thereof relative to the sheet body portion and thereby defines at least in substantial part with the sheet body portion a pocket having an open top;

the sheet body portion and the sheet tab portion together at least in substantial part define a tabbed divider including a divider sheet and a tab extending laterally out from a side edge of the divider sheet; and

the continuous sheet includes a sheet pocket flap extending out from a side edge of the sheet pocket panel, the sheet pocket flap being in a folded under position and secured to the sheet body portion, between the sheet pocket panel and the sheet body portion, wherein an exposed strip of the sheet body portion is provided between the sheet pocket flap and a side edge of the sheet body portion.

US 6,409,410 B1

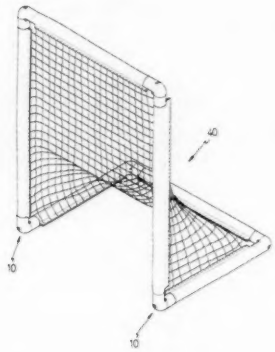
COUPLER FOR SPORT PRACTICE NET RACK

Kuang Hui Huang, No. 91, Ai-Kuo Street, Feng-Yuan City, Taiwan

Filed Oct. 4, 2000, Appl. No. 678,250

Int. Cl. F16C *11/00*

U.S. Cl. 403—65 **4 Claims**



1. A coupler for a sport practice net rack comprising:

a first angular tube (**20**) having a first flat section (**21**) and a first angular section (**22**); and

a second angular tube (**30**) pivotally mounted on said first angular tube (**20**) and having a second flat section (**3 1**) and a second angular section (**32**), said second angular section (**32**) of said second angular tube (**30**) detachably received in said first angular section (**22**) of said first angular tube (**20**); wherein,

said first angular section (**22**) of said first angular tube (**20**) defines a locking slot (**220**), and said second angular section (**32**) of said second angular tube (**30**) includes an elongated flexible piece (**320**) having a press button (**322**) detachably secured in said locking slot (**220**) of said first angular section (**22**) of said first angular tube (**20**); and

said second angular section (**32**) of said second angular tube (**30**) defines two elongated slits (**324**) spaced from each other, thereby defining said elongated flexible piece (**320**).

US 6,409,411 B1

MODULAR TOOLING COUPLING APPARATUS

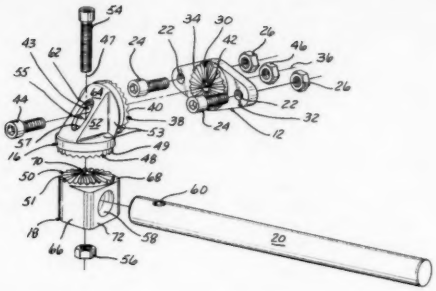
David J. Crorey, Clinton Township, Mich., assignor to Norgren Automotive, Inc., Mt. Clemens, Mich.

Filed Dec. 13, 1999, Appl. No. 458,519

Int. Cl. E04G *3/00*

U.S. Cl. 403—97 **38 Claims**

1. A coupling apparatus for adjustably mounting modular tooling members comprising:



a base member releasably connectable to a slide mount wherein said base member is adjustably located along a predetermined path of travel and said base member having a first contoured surface;

a midportion having second and third contoured surfaces wherein said second contoured surface matingly engages and is adjustably connected to said first contoured surface of said base member for rotatably adjusting said midportion about a first axis;

an end member releasably connectable to a tooling rod, and said end member having a fourth contoured surface wherein said third contoured surface of said midportion matingly engages and is adjustably connected to said fourth contoured surface of said end member for rotatably adjusting said end member about a second axis; and

said base member, said midportion, and said end member fabricated from cast aluminum.

US 6,409,412 B1

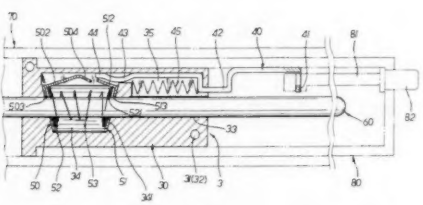
ADJUSTABLE LOCKING/UNLOCKING STRUCTURE FOR TELESCOPIC TUBE

Chien-Jen Huang, No. 24, Alley 140, Da Quan Rd. Sec. 2, Panchiau Taipei Hsien, Taiwan

Filed Jan. 10, 2001, Appl. No. 756,713

Int. Cl. F16B *7/14*

U.S. Cl. 403—109.3 **4 Claims**



1. An adjustable locking and unlocking structure for a telescopic tube, comprising two locating members mated with each other, an actuating push plate, a restoring spring, a main restricting plate, a subsidiary restricting plate, several restricting rings, a compression spring and an adjustment rod, the actuating push plate and the restoring spring being disposed in slide channels formed on the locating members, said locking and unlocking structure including:

an inner face of each of the locating members is formed with a central arch channel for the adjustment rod to pass therethrough, a middle rear section of the arch channel being cut with a restricting cavity which is downwardly tapered into a trapezoid shape, a front and a rear walls of the tapered restricting cavity being formed with sloped sides;

the main restricting plate includes a circular restricting ring section and a bent press section integrally connected with an upper side of the restricting ring section and extending therefrom by a predetermined length, the restricting ring section being formed with a central restricting hole, a free end of the bent press section being bent to form a driving section;

the subsidiary restricting plate includes a circular restricting ring section and a bent press section integrally connected with an upper side of the restricting ring section and extending therefrom by a shorter length, the restricting ring section being formed with a central restricting hole;

each of the restricting rings is formed with a central frictional stop hole smaller than the restricting holes of the main and subsidiary restricting plates;

an outer diameter of the adjustment rod is smaller than the diameter of the stop hole of the restricting ring, the adjustment rod having a length equal to that of a mother tube; and

the main and subsidiary restricting plates are respectively positioned in the restricting cavities of the locating members, the restricting ring sections of the main and subsidiary restricting plates being inclinedly attached to the slope sides of the restricting cavities, the restricting rings being positioned between the opposite faces of the main and subsidiary restricting plates, the compression spring being positioned between two innermost restricting rings, by means of pressing the press sections of the main and subsidiary restricting plates, the adjustment rod being fitted into the arch channels of the locating members, whereby a daughter tube is firmly located in the mother tube and can be stagelessly adjusted in length.

US 6,409,413 B1

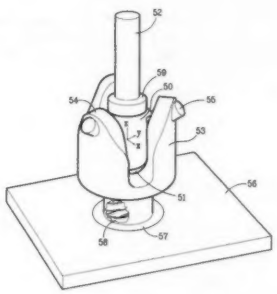
LARGE DISPLACEMENT SPHERICAL JOINT

Lothar F. Bieg, and Gilbert L. Benavides, both of Albuquerque, N. Mex., assignors to Sandia Corporation, Albuquerque, N. Mex.

Filed Jun. 18, 1999, Appl. No. 336,182

Int. Cl. F16C *11/06*

U.S. Cl. 403—115 **7 Claims**



1. A spherical joint, comprising:

a) a spherical body;

b) a first shaft affixed to said spherical body;

c) a camming housing having a vertical axis, the camming housing comprising a cam surface that is substantially oblique to the vertical axis and is positioned to functionally engage with the first shaft;

d) a plurality of bearings positioned about and restricting the motion of said spherical body relative to the camming housing to rotations about the center of the spherical body, wherein a first bearing of said plurality of bearings comprises a bearing cup affixed to the camming housing;

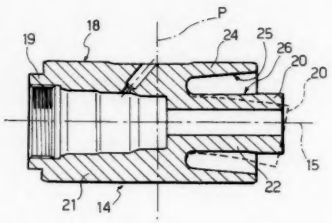
e) a revolute joint between the camming housing and a joint base; and, said joint base whereby when said first shaft functionally engages said camming housing a force is generated responsive to the motion of said first shaft and a resulting torque causes said camming housing to rotate about said vertical axis on said revolute joint.

US 6,409,414 B1

PIN FOR CONNECTING GEARS TO A SUPPORTING MEMBER, AND TRANSMISSION FEATURING SUCH A PIN

Paolo Altamura, Monopoli, and Giovanni Oddone, Predosa, both of Italy, assignors to Fiatavio S.p.A., Turin, Italy

Filed Feb. 10, 2000, Appl. No. 501,432
Claims priority, application Italy, Feb. 12, 1999, TO99A0109
Int. Cl. F16H *57/08*
U.S. Cl. 403—284 6 Claims



1. A pin (**14**) for connecting a gear (**5**) to a supporting member (**6**); the pin (**14**) having a respective axis (**15**), and comprising:

a first (**19**) and a second (**20**) longitudinal end portion connectable to said supporting member (**6**);

a first intermediate portion (**21**) extending from said first end portion (**19**); and

a second intermediate portion (**22**) extending from said second end portion (**20**);

characterized in that said first (**21**) and said second (**22**) intermediate portion differ from each other in size and in flexural strength, wherein said first intermediate portion (**21**) has a cross section, measured in a plane perpendicular to said axis (**15**), greater than a cross section of said second intermediate portion (**22**) measured in a further plane parallel to said plane; and

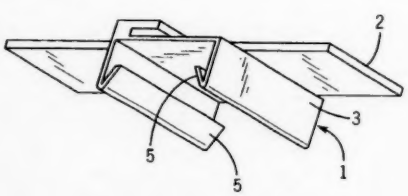
wherein the pin is defined laterally by a cylindrical supporting surface (**18**), and by also comprising a single tubular portion (**24**) projecting, coaxially with said axis (**15**), from said first intermediate portion (**21**), and surrounding said second intermediate portion (**22**); said single tubular portion (**24**) being defined externally by said cylindrical surface (**18**).

US 6,409,415 B1

HANGER

Ellis I. Toder, Abington, Pa., assignor to In Pro Corporation, Muskego, Wis.

Filed Oct. 3, 1996, Appl. No. 725,411
Int. Cl. B42F *13/00*; F16B *1/00*
U.S. Cl. 403—397 10 Claims



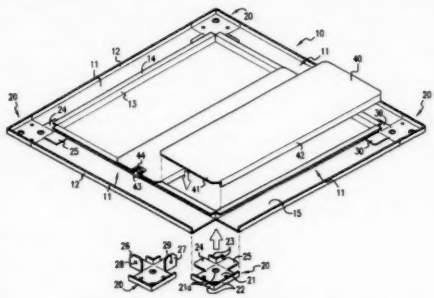
1. A clip adapted to connect a strip with a track, with mutual orientation of said clip and said strip that may be selectively chosen without disengagement, said clip comprising a rectangular clip top having edges, a pair of upper grip portions diagonally oppositely positioned at corners of said clip top, each of said upper grip portions integral with said clip top at the corners of said clip top, and each of said upper grip portions defining a diagonal slot at each corner of said clip top between said upper grip portion and said clip top, each slot facing directly toward the slot on the opposite corner.

US 6,409,416 B1

RACK FOR A SWITCH CABINET

Wolfgang Reuter, Burbach, Germany, assignor to Rittal-Werk Rudolf Loh GmbH & Co. KG, Herborn, Germany

PCT No. PCT/EP98/04302, § 371 Date Jan. 14, 2000, § 102(e) Date Jan. 14, 2000, PCT Pub. No. WO99/04470, PCT Pub. Date Jan. 28, 1999
PCT Filed Jul. 11, 1998, Appl. No. 462,984
Claims priority, application Germany, Jul. 16, 1997, 197 30 430
This patent is subject to a terminal disclaimer.
Int. Cl. A47F *7/00*; H02B *1/01*; B25G *3/36*
U.S. Cl. 403—402 10 Claims



1. In a rack for a switchgear cabinet, the rack including a bottom frame in a bottom area of the rack and enclosing an opening closeable by bottom panels, an improvement comprising:

the bottom frame (**10**) assembled from four adjoining U-profile sections (**11**) and four square corner elements (**20**), wherein the U-profile sections (**11**) open upwardly, have an outer edge (**12**) bent upward at a right angle and an L-shaped inner edge (**13**, **14**) oriented toward the outer edge (**12**), the corner elements (**20**) covering the adjoining U-profile sections (**11**) with fastening flanges (**24**, **25**) and connecting the adjoining U-profile sections (**11**), and

the corner elements (**20**) each having an inside angle bracket (**23**) aligned against insides of the inner edge (**13**, **14**) of the adjoining U-profile sections (**11**) and an outside angle piece (**22**) in corner areas completing the outer edge (**12**) of the adjoining U-profile sections.

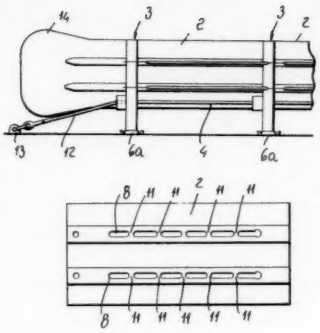
US 6,409,417 B1

SAFETY ROAD BARRIER END ASSEMBLY WITH A GRADUAL ABSORPTION OF THE IMPACT ENERGY

Franz Muller, Via Scheiwiller, 1, 20122, and Marco Anghileri, Via Londonio, 10, 20100, both of Milano, Italy

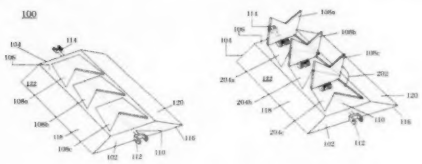
Filed Feb. 2, 2000, Appl. No. 496,837
Claims priority, application Italy, Feb. 3, 1999, MI99A0196
Int. Cl. G01F *15/00*
U.S. Cl. 404—6 4 Claims

1. A safety road barrier end assembly, comprising a plurality of multiple corrugated horizontally extending lateral corrugated panels coupled to a plurality of vertical supporting piers by sliding coupling means allowing friction and plastic deformation in a direction parallel to a longitudinal extension of safety road barriers and anchoring means for anchoring said supporting piers to a ground, each said supporting pier comprising a plurality of ground bearing feet and said anchoring means comprising a guide pier engaging cable having end portions coupled to the ground, said sliding coupling means comprising sliders coupling said corru-



gated panels to said supporting piers, said sliders including engaging pins for engaging with corresponding longitudinal slots of said corrugated panels, said slots having a width less than the diameter of said pins of said sliders.

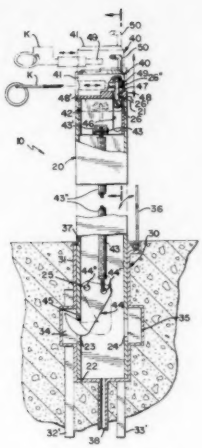
US 6,409,418 B1
TIRE DEFLATING BLADE SYSTEM
William H. Blair, Wheeling; David R. Blair, Triadelphia, and Robert E. Steele, Wheeling, all of W. Va., assignors to PMG, Inc., Wheeling, W. Va.
Provisional application No. 60/132,208, filed on May 3, 1999. This application May 3, 2000, Appl. No. 563,320.
Int. Cl. E01F *13/12*
U.S. Cl. 404—6 **20 Claims**



1. A tire deflating blade system module, comprising:
a base having a top surface;
a shaft longitudinally disposed within said base and having a length;
two or more blades pivotally connected to said shaft wherein said two or more blades are positioned along the length of said shaft such that two adjacent said blades are separate by a predefined distance, each said blade having a plurality of sharpened edges and one or more sharp points; and
a means for engaging said blades into an armed position and into a retracted position, wherein said means for engaging moves said shaft along a longitudinal axis within said base such that when said shaft moves in a first longitudinal direction, said blades are moved into said armed position, and when said shaft moves in a second longitudinal direction, said blades are moved into said retracted position.

US 6,409,419 B1
REMOVABLE SECURITY POST ASSEMBLY
Rigoberto Hernandez, 5371 W. 4 Ct., Hialeah, Fla. 33012
Filed Oct. 23, 2000, Appl. No. 693,874
Int. Cl. E06B *11/00*
U.S. Cl. 404—6 **5 Claims**

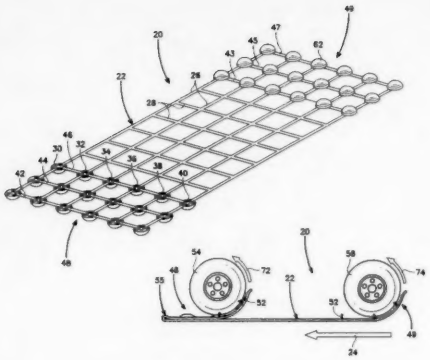
1. A removable security post assembly, comprising:
an anchorage assembly positioned below ground level and including first housing means having first and second ends and said first end being an opening adjacent to the ground



level, and said anchorage assembly further includes anchorage means rigidly mounted to said first housing means, and wherein said first housing means has at least one bay member that is outwardly and perpendicularly projected with respect to said first housing means,
an elongated post member removably and partially received within said first housing means, said elongated post member is tubular having first and second opened ends, and said elongated post member further includes at least one lateral opening, that once the former is placed inside said first housing means, said lateral opening is in horizontal alignment with said bay member,
a second housing means mounted to said first opened end of said elongated post member and is slidably received inside said elongated post member, and
a locking assembly including a lock for securing said elongated post member to said anchorage assembly, said locking assembly is mounted to said second housing means, and once a user actuates said locking assembly, the latter along with said second housing means slide downwardly and inside said post member.

US 6,409,420 B1
PORTABLE VEHICLE BARRIER
Craig Howard Horton, and Gary R. Cook, both of Ventura, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jul. 2, 2001, Appl. No. 895,102
Int. Cl. E01F *13/12*
U.S. Cl. 404—6 **20 Claims**

1. A portable vehicle barrier for disabling a vehicle having front and rear tires traveling across said portable vehicle barrier comprising:
(a) a generally rectangular shaped barrier device comprising a net, said net including a plurality of elongated cables which are evenly spaced apart and a plurality of cross cables which are evenly spaced apart and are perpendicular to the elongated cables of said net;
(b) a lead array of said cross cables including first, second, and third rows of said cross cables located at a front end of said net;
(c) a trailing array of said cross cables including N–2, N–1, and N rows of said cross cables located at a rear end of said net, wherein N is an integer greater than or equal to three;
(d) each of the cross cables of the lead array of said cross cables and the trailing array of said cross cables intersecting the elongated cables of said net at a plurality of intersection points;



(e) a first array of spikes, one of said first array of spikes being connected to each of the plurality of intersection points of the lead array of said cross cables on an upper side of said net;

(f) a first array of dome shaped covers, one of said first array of dome shaped covers resting on top of an associated one of said first array of spikes and being removable from said associated one of said first array of spikes;

(h) a second array of spikes, one of said second array of spikes being connected to each of the plurality of intersection points of the trailing array of said cross cables on a lower side of said net, said trailing array of spikes being folded over a middle portion of said net to expose said second array of spikes to the front tires of said vehicle;

(i) a second array of dome shaped covers, one of said second array of dome shaped covers resting on top of an associated one of said second array of spikes and being removable from said associated one of said second array of spikes;

(j) removal means for jettisoning said first array of dome shaped covers and said second array of dome shaped covers from said net after the front tires of said vehicle pass over the lead array of said cross cables exposing the front tires of said vehicle to said second array of spikes and the rear tires of said vehicle to said first array of spikes; and

(l) said second array of spikes being capable of puncturing and adhering to the front tires of said vehicle and said first array of spikes being capable of puncturing and adhering to the rear tires of said vehicle, thereby resulting in the rear end of said net being wrapped around the front tires of said vehicle and the front end of said net being wrapped around the rear tires of said vehicle disabling said vehicle when said vehicle travels across said portable vehicle barrier.

US 6,409,421 B1
OVERLAPPING CONNECTOR FOR AN EDGE RESTRAINT

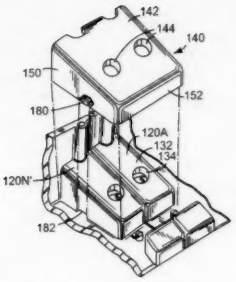
Stephen Jones, 10800 Morris Ave. South, Bloomington, Minn. 55437

Filed May 11, 1998, Appl. No. 75,259
Int. Cl. E01C *11/22*
U.S. Cl. 404—7 **26 Claims**

1. An edge restraint system, comprising:

a first edge restraint section having a longitudinal length and including a connector arranged at one end of said edge restraint section; and

a second edge restraint section including a substantially upright wall and a bracing system extending away from one side of said upright wall, said bracing system defining a plurality of openings along the longitudinal length of the second edge restraint section, the longitudinal length of the second edge restraint section being variably configurable such that one of said plurality of openings is maintained at a longitudinal end of said second edge restraint section;

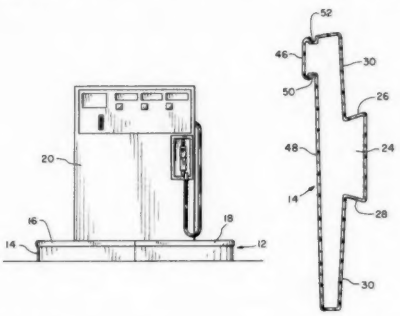


wherein said connector comprises at least one wall which overlaps a top surface of said one opening of said second edge restraint section.

US 6,409,422 B1
PLASTIC CONCRETE FORM

Armin E. Mittermaier, and Donald E. Rhodes, both of Fort Wayne, Ind., assignors to Poly Concrete Forms, Inc., Fort Wayne, Ind.

Filed Aug. 27, 1998, Appl. No. 141,275
Int. Cl. E01F *1/00;15/00;* **E04G** *9/00*
U.S. Cl. 404—8 **6 Claims**



1. A fuel dispenser assembly comprising:

a fuel dispenser;

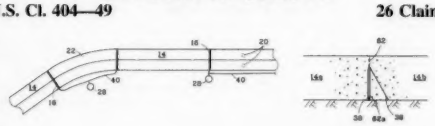
a non-metallic rotationally molded form, said form surrounds an inner cavity, said form including a dovetail section which acts to form an anchor, said non-metallic form capable of supporting poured concrete; and

a poured concrete base, said base formed within said cavity, said fuel dispenser located above said form and connected to said base.

US 6,409,423 B1
PRESTRESSED PAVEMENT SYSTEM

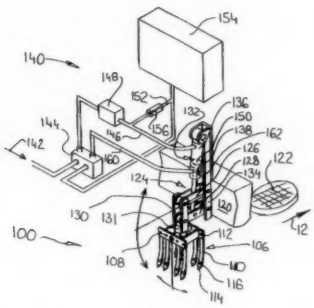
Ran Li, c/o Yaxin Li, 710 Fontana Pl., Mundelein, Ill. 60060

Continuation-in-part of application No. 08/235,338, filed on Apr. 29, 1994, now abandoned. This application Mar. 15, 1996, Appl. No. 616,086.
Int. Cl. E01C *11/10;* **E04C** *5/08*
U.S. Cl. 404—49 **26 Claims**



1. A prestressed pavement comprising:
(a) slabs on a support base,
(b) at least one hydraulic apparatus between said slabs for providing prestress on said slabs, and
(c) means for regulating said prestress, said means communicating with said apparatus and comprising hydraulic means for supplementing said prestress and damping the prestress rise.

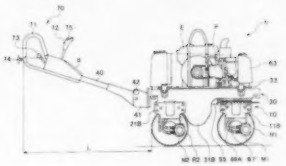
US 6,409,424 B1
ASPHALT RAKE WITH RIDE UP CAPABILITY
Francesco A. Crupi, 2845 Seabreeze Dr. South, Gulfport, Fla. 33707
Filed Jun. 13, 2000, Appl. No. 592,773
Int. Cl. E01C *23/12*
U.S. Cl. 404—94 **19 Claims**

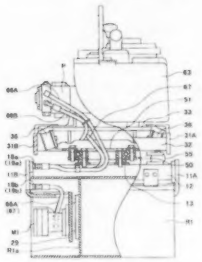


1. A raking device for breaking up a surface, said raking device comprising:
a plurality of rakes mounted on a rake frame and arranged to produce an upwardly directed resultant force in response to a horizontally directed force arising from encountering an obstruction in a path of travel of said raking device;
a rake frame support mounting said rake frame to a rake frame carrier structure and allowing controlled movement of said rakes in a vertical direction;
a force applicator acting between said rake frame carrier structure and said rake frame support for applying at least a downward force to said plurality of rakes, said force applicator being responsive to an increase in said upwardly directed resultant force above a preset amount to allow said plurality of rakes to move upwardly in response to said increase.

US 6,409,425 B1
HAND GUIDED VIBRATING ROLLER
Mikio Okabe, and Tetsuya Koseki, both of Saitama, Japan, assignors to Sakai Heavy Industries, Ltd., Tokyo, Japan
Filed Oct. 30, 2000, Appl. No. 698,194
Claims priority, application Japan, Oct. 28, 1999, 11-306475; Sep. 21, 2000, 2000-286916
Int. Cl. E01C *19/38;19/24*
U.S. Cl. 404—117 **3 Claims**

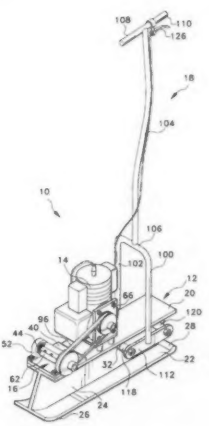
1. A hand guided vibrating roller comprising a pair of front and rear roller wheels provided in parallel, a machine supported by said pair of the front and rear roller wheels, a hydraulic pump mounted on said machine, a hydraulic motor for driving said roller wheels, provided inside said roller wheels, and a steering rod elongating from the rear portion of said machine, said hand guided vibrating roller comprising:
a supporting frame freely rotated around a vertical axis, supporting at least one of said roller wheels; and
an actuator for rotating said supporting frame,
wherein said supporting frame is rotatively supported by a slewing rim bearing provided right above said roller wheel,





and said hydraulic pump and said hydraulic motor for driving said roller wheel are jointed by hydraulic hoses inserted into a hollow portion of said slewing rim bearing.

US 6,409,426 B1
VIBRATORY TAMPING TOOL
Kevin MacLellan, 529 Maple Hill Rd., Guilford, Conn. 06437
Filed Feb. 22, 2000, Appl. No. 510,511
Int. Cl. E01C *19/32*
U.S. Cl. 404—133.1 **5 Claims**



1. A vibratory tamping tool comprising:
(a) a base having an elongate top plate, an elongate bottom plate, and an elongate web plate normal to and joined to the top plate and the bottom plate by welding, the bottom plate defining a tamping surface, the top plate having a top surface;
(b) a vibratory mechanism having:
(i) a pair of journal bearings mounted in parallel spaced relation on the top surface of the top plate of said base;
(ii) a shaft rotatably mounted in the journal bearings; and
(iii) an eccentric weight fixedly attached to the shaft between the journal bearings;
(c) a motor mounted on the top surface of the top plate of said base, said motor being coupled to the shaft of said vibratory mechanism; and

(d) a handle attached to said base in order to allow a user to guide and control the vibratory tamping tool;

wherein rotation of the shaft of said vibratory mechanism causes said base to vibrate, separation of the top plate and the bottom plate by the web plate permitting the tamping surface to have an area independent of a surface area required to mount said vibratory mechanism and said motor, and permitting the tamping surface to be tilted relative to horizontal in order to tamp a surface at an angle.

US 6,409,427 B1

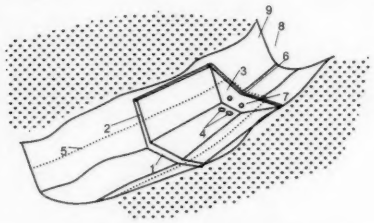
SOIL EROSION COLLECTOR

Walter S. Maxwell, III, 11000 Tannery Creek Rd., Corning, N.Y. 14830

Provisional application No. 60/155,377, filed on Sep. 20, 1999. This application Sep. 20, 2000, Appl. No. 665,801.

Int. Cl. E02B *13/00;7/00*

U.S. Cl. 405—39 **7 Claims**



1. A soil erosion collector for collecting soil in a ditch having walls, comprising a unitary concrete body comprising:

a) a flat rectangular floor having an upstream end, a downstream end, and two sides, the floor having a plurality of drain holes;

b) two rectangular wings, each wing having an upstream end and a downstream end, an upper side and a lower side, the upper and lower sides of the wings being equal in size to the sides of the floor; the lower side of each wing being mounted to a side of the floor, such that the wings meet the floor at an angle chosen such that the wings fit against the walls of the ditch;

c) a dam having a lower portion fitting against the downstream end of the floor, side portions fitting against the downstream ends of the two wings, and a spillway portion connecting the downstream ends of the upper sides of the wings; and

d) a toe located below the floor, at the upstream end of the two wings.

US 6,409,428 B1

APPARATUS FOR SECURING A TUBULAR STRUCTURE TO AN ANCHOR

Olivier Moog, Aspach-le-Haut, France, assignor to Techlam, Cernay Cedex, France

Filed Sep. 28, 2000, Appl. No. 670,803

Int. Cl. F16L *1/16*

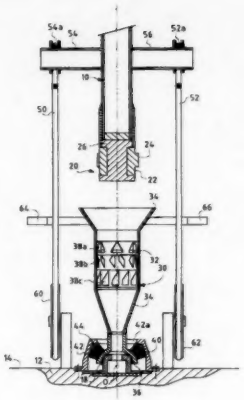
U.S. Cl. 405—169 **7 Claims**

1. An apparatus for releasably securing a tubular structure of a floating installation to an anchor fixedly secured to an underwater floor comprising:

a first connection element mounted at one end of said tubular structure;

a second connection element configured and dimensioned at one end to couple with said first connection element along generally vertical central axes defined by said first and second connection elements, said second connection element including at least a pair of guides secured thereto;

a hinge device connecting said second connection element to said anchor such that said second connection element is pivotably connected to said anchor; and



a plurality of cables connecting to both said tubular structure and said anchor, said pair of guides cooperating with said cables such that when said cables are under tension, said cables urge said second connection element to pivot and align with said first connection element.

US 6,409,429 B1

BACKPACK FOR UNDERWATER BREATHING GAS TANKS

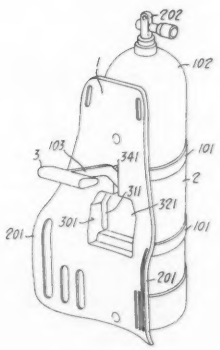
Alberto Belloni, Recco, Italy, assignor to HTM Sport S.P.A., Italy

Filed Jul. 24, 2000, Appl. No. 624,164

Claims priority, application Italy, Jul. 28, 1999, GE99U0026

Int. Cl. B63C *11/22;* **A45F** *3/08*

U.S. Cl. 405—186 **5 Claims**



1. A backpack for underwater breathing gas tanks comprising:

a substantially flattened body;

means at one side of said body for connecting at least one tank to said body;

means at the other side of said body for connecting with a diver's back;

said body having a cavity provided on the side designed for connecting with the diver's body; and

carrying means for lifting the backpack, attached to said body, wherein said carrying means is capable of being rotated to a raised, active position such that the carrying means is outside said cavity and an inserted, inactive position such that the carrying means is located completely inside said cavity.

US 6,409,430 B1

WELHEAD TEMPLATES

Paul M Shepherd, Aberdeen, United Kingdom, assignor to Kvaerner Oilfield Products Limited, London, United Kingdom

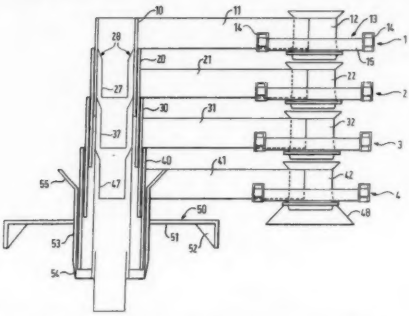
PCT No. PCT/GB99/02084, § 371 Date Jan. 25, 2001, § 102(e) Date Jan. 25, 2001, PCT Pub. No. WO00/01923, PCT Pub. Date Jan. 13, 2000

PCT Filed Jul. 1, 1999, Appl. No. 720,987

Claims priority, application United Kingdom, Jul. 3, 1998, 9814343

Int. Cl. E21B *7/12;41/08*

U.S. Cl. 405—195.1 **12 Claims**



1. A sub-sea well template comprising a plurality of limbs (**1–4**) each of which comprises an arm (**11–41**) having a hub (**10–40**) at one end and a drilling guide (**12–42**) at the other end, the hubs fitting one within another for rotation about a common axis and the limbs being mutually rotatable from a configuration wherein the arms are close together to a configuration in which the arms are widely splayed.

US 6,409,431 B1

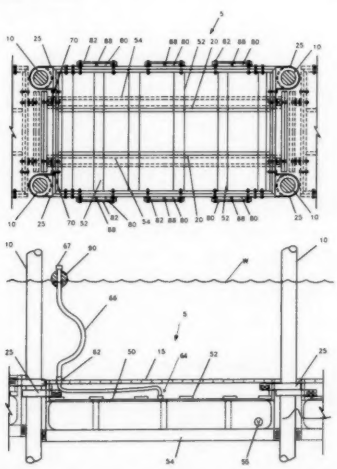
SUBMERSIBLE FLOATING DOCK

Thomas S. Lynch, 5719 Park Ave., Wilmington, N.C. 28403

Filed Feb. 17, 2000, Appl. No. 506,517

Int. Cl. B63C *1/02;* **B63B** *35/42*

U.S. Cl. 405—200 **17 Claims**



1. A submersible floating dock resistent to damage from water, wave action, and winds caused by at least a gale force storm comprising:

(a) a deck adapted for use by people;

(b) connected to said deck at least one hollow enclosed floatation chamber impermeable to air and water and sufficiently large to buoyantly support said deck in water when said at least one hollow enclosed floatation chamber is filled with air;

(c) in said at least one hollow enclosed floatation chamber at least one aperture, said at least one aperture for introduction of air into said at least one hollow enclosed floatation chamber, said at least one aperture for evacuation of air out of said at least one hollow enclosed floatation chamber, said at least one aperture for introduction of water into said at least one hollow enclosed floatation chamber, and said at least one aperture for discharge of water out of said at least one hollow enclosed floatation chamber;

(d) means for allowing said deck and said at least one hollow enclosed floatation chamber to move in a vertical direction;

(e) means for restraining said deck and said at least one hollow enclosed floatation chamber from moving in a horizontal direction.

US 6,409,432 B1

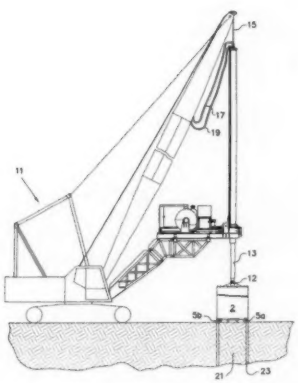
DOWNHOLE HAMMER-TYPE CORE BARREL AND METHOD OF USING SAME

August H. Beck, III, 10 Hearthwood, San Antonio, Tex. 78248

Division of application No. 09/098,940, filed on Jun. 17, 1998, now Pat. No. 6,189,630. This application Feb. 19, 2001, Appl. No. 788,726.

Int. Cl. E02D *5/34;* **E21B** *4/16*

U.S. Cl. 405—239 **32 Claims**



1. A method of constructing a pile in the ground, for use in foundation systems or underground barriers, comprising lowering a hollow-interior core barrel beneath the surface of the ground into a shaft created by said core barrel, said core barrel having a plurality of hammer drills disposed proximate the perimeter of said core barrel;

rotating said core barrel while operating said plurality of hammer drills, thereby to drill an annular kerf around a core;

withdrawing the core barrel from the kerf after completion of said rotating step;

removing the core; and

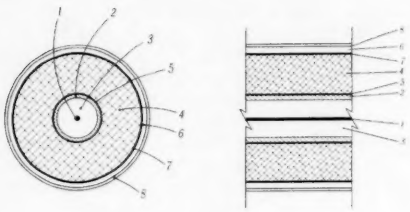
placing a cementitious material in the shaft to form a pile.

US 6,409,433 B1

FOUNDATION PILES OR SIMILAR LOAD CARRYING ELEMENTS

David A. Hubbell, 112 Park Ave., Saranac Lake, N.Y. 12983, and Alfred W. Owen, 5848 Sentinel Dr., Raleigh, N.C. 27609

Filed Jan. 27, 2000, Appl. No. 492,393
Int. Cl. E02D *5/22;* E04C *5/08;3/30*
U.S. Cl. 405—250 11 Claims



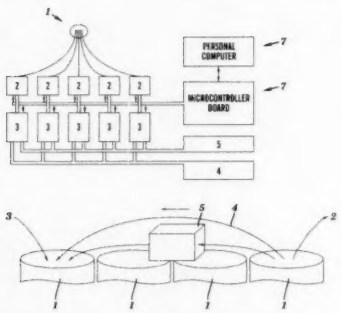
1. A foundation pile, comprising at least one elongated tensioning tendon which is elongated in a direction of elongation; means forming a hollow conduit located around said at least one tendon so that a space remains between said tensioning tendon and said hollow conduit; a structural tubular element located around said hollow conduit and composed of a non-metallic material; a tubular layer of a composite material located around said structural tubular element and connected with the later; and a friction coating applied on an outer surface of said layer of composite material.

US 6,409,434 B1

DEVICE FOR MANIPULATION OF OBJECTS ON A PNEUMATIC SURFACE

Kaspar Tobias Winther, Troy, N.Y., assignor to Rensselaer Polytechnic Institute, Troy, N.Y.

Provisional application No. 60/118,129, filed on Feb. 1, 1999. This application Jan. 28, 2000, Appl. No. 494,260.
Int. Cl. B65G *51/16*
U.S. Cl. 406—15 12 Claims



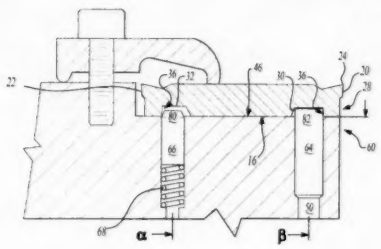
1. A pneumatic active surface device for manipulating miniature objects which comprises an array of parallel fluid conduits, the ends of which form a smooth surface on which an object is observed and manipulated and which are conduits for leading a gaseous fluid, including air, to and from the surface, variable position valves associated with each conduit which control airflow through each conduit, a pressure sensor attached to at least some of the conduits between the active surface and the valve for reading the pressure in the tube, a pressurized gaseous fluid source and a vacuum reservoir connected to each conduit, means for operating the valves individually to provide vacuum or positive pressure to individual conduits, and means to process and display individual sensor output and control the position of the individual valves.

US 6,409,435 B1

CUTTING TOOL AND METHOD OF LOCATING CUTTING INSERT

Yevgeny Kocherovsky, W. Bloomfield; Lee Reiterman; Foye Powell, both of Troy, all of Mich., and Edward Santimaw, Anderson, S.C., assignors to Valenite Inc., Madison Heights, Mich.

Filed Jul. 3, 2000, Appl. No. 609,522
Int. Cl. B23B *29/04*
U.S. Cl. 407—104 20 Claims



1. A cutting tool comprising:

(a) a toolholder having an insert receiving region,

(b) a replaceable cutting insert securable within the region, the replaceable insert having a body defined by a top surface, a bottom surface, at least one flank extending therebetween, and at least one cutting edge formed by intersection of at least a portion of a flank and one of the top and bottom surfaces,

(c) a first locating unit disposed on at least one of the top and bottom surfaces of the insert body and comprising a stationary insert locator element proximate each cutting edge,

(d) a second locating unit disposed in the insert receiving region, the second locating unit comprising at least one stationary toolholder locator element adapted to matingly engage a stationary insert locator element so that at least one cutting edge is located as an active cutting edge, each of the stationary locator elements comprising a bearing surface,

(e) a tensioning device for urging into abutment the bearing surfaces on stationary insert locator elements and stationary toolholder locator elements which are matingly engaged, whereby the relative location of the toolholder and the active cutting edges is determined by said abutment of bearing surfaces.

US 6,409,436 B1

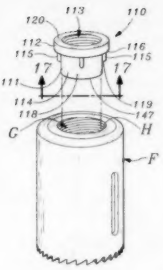
PLUG EJECTING HOLE SAW WITH TWIST-LOCKING INTERCHANGEABLE SAW CUPS

Roger J. Despres, 17230 San Mateo St., # L12, Fountain Valley, Calif. 92708

Division of application No. 09/517,215, filed on Mar. 2, 2000, now Pat. No. 6,341,925. This application Aug. 14, 2001, Appl. No. 929,689.
Int. Cl. B23B *51/04;47/34*
U.S. Cl. 408—68 7 Claims

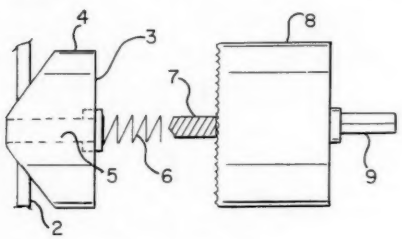
1. An adapter for converting a hole saw cup having a right-hand threaded saw cup bore through a base wall thereof to a hole-ejecting hole saw comprising:

a generally cylindrically-shaped body having disposed longitudinally therethrough a left-hand threaded bore, said body having protruding radially outwardly from a cylindrical wall surface thereof at least a first pair of longitudinally disposed



ribs adapted to penetrate internal threads of said saw cup bore and thereby retain said body within said saw cup bore.

US 6,409,437 B1
HOLE SAW CENTERING DEVICE
William Davis Metzger, 2315 Urban Rd., Jacksonville, Fla. 32110
Filed Oct. 16, 2000, Appl. No. 687,164
Int. Cl. B23B *51/04*
U.S. Cl. 408—80 **20 Claims**

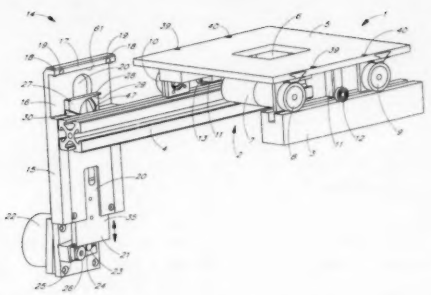


1. A hole saw centering device for use in combination with a toothed edge cylindrical hole saw having a cavity therein defined by an internal cylindrical hole saw having a cavity therein defined by an internal cylindrical wall, said device comprising a cone element having a conical surface extending between its forward end and terminating at a cylindrical shoulder adjacent its rearward end, said shoulder having an external diameter comforming to and smaller than an internal diameter of a cylindrical hole saw to which said device is used so that said shoulder may guide and stabilize a cylindrical hole saw as it cuts into a work piece with said forward end disposed within a previously drilled hole in a work piece.

US 6,409,438 B1
METHOD AND SYSTEM FOR POSITIONING OF A CARRIER FOR WORK PIECES
Dietmar Kohler, Dornbirn, Austria, assignor to Heron Sondermaschinen und Steuerungen GmbH, Dornbirn, Austria
Filed Sep. 20, 1999, Appl. No. 399,999
Claims priority, application Germany, Sep. 18, 1998, 198 42 774
Int. Cl. B23Q *7/00*
U.S. Cl. 409—131 **16 Claims**

1. A method for positioning a workpiece carrier in a machining station, wherein the workpiece carrier is movable on a rail system and a machining of a workpiece arranged on the workpiece carrier takes place in at least one machining station arranged along the rail system, comprising:

individually operating a workpiece carrier within the rail system, wherein the workpiece carrier is self-driven by a drive motor mounted on the workpiece carrier;



introducing the workpiece carrier to a machining station;

decelerating the workpiece carrier with a deceleration device while introducing the workpiece carrier to a positioning device;

positioning the workpiece carrier relative to a stationary reference surface using the positioning device;

uncoupling the workpiece carrier from the rail system within the machining station;

precisely holding the workpiece carrier in place while being decoupled from the rail system;

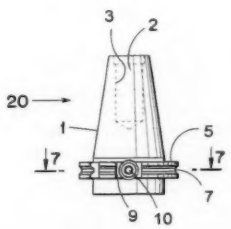
machining the workpiece;

releasing the workpiece carrier from the positioning device;

accelerating the workpiece carrier to a predetermined initial velocity using an acceleration device while leaving the positioning device; and

moving the workpiece carrier along the rail system.

US 6,409,439 B1
CONVERTIBLE TOOL HOLDER FOR A MACHINE TOOL
Bertrand Riviére, Bourges, France, assignor to Seco Tools AB, Fagersta, Sweden
Filed Oct. 11, 2000, Appl. No. 685,875
Claims priority, application Sweden, Oct. 12, 1999, 9903654
Int. Cl. B23C *1/20*
U.S. Cl. 409—131 **9 Claims**



1. A holder for a machine tool, comprising:

a cone-shaped base body having a large-diameter end and a small-diameter end, both such ends being intersected by a longitudinal axis of the body, the large-diameter end including an annular flange having first and second diametrically opposite recesses formed therein, each of the recesses extending completely through the respective flange in a direction generally parallel to the longitudinal axis and being open radially, each of the recesses including a radially outwardly facing bottom surface, the first and second recesses respectively forming identical first distances from the bottom surface to an outer periphery of the flange, one of the recesses including a blind hole formed in the bottom surface thereof; and

a depth-reducing element securable in the blind hole such that a radially outwardly facing outer surface of the element is disposed between the bottom surface and the outer periphery,

wherein an effective depth of the recess having the depth-reducing element is shorter than an effective depth of the other recess.

US 6,409,440 B1

METHOD FOR CUTTING A PIECE OF SHEET METAL USED TO HOLD A LAYER OF NEUTRON-ABSORBING MATERIAL ON A WALL OF AN ATOMIC FUEL ASSEMBLY STORAGE RACK CELL

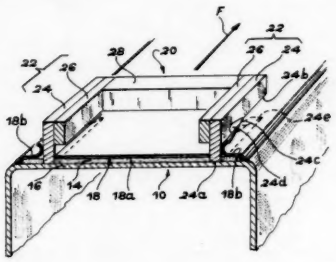
Jean-Paul Souchet, Carquefou, and Marc Doukhan, Sautron, both of France, assignors to Societe Atlantique de Techniques Avancees-ATEA-, Carquefou, France

Filed Apr. 21, 2000, Appl. No. 556,108

Claims priority, application France, Apr. 23, 1999, 99 05175

Int. Cl. B23C *3/00;* **G21C** *19/00;19/32*

U.S. Cl. 409—132 **12 Claims**



1. Method for cutting a substantially rectangular piece of sheet metal, having two short sides and two long sides welded onto a wall of a nuclear fuel assembly storage rack cell, such that a layer of neutron-absorbing material, held initially between the sheet metal and said wall, may be removed, wherein said method comprises the following stages:

cutting the two short sides of the sheet metal;

cutting the two long sides of the sheet metal in a continual movement from one end of the sheet metal to the other with a cutting head that includes at least one single blade or one blade assembly comprising at least one blade and one blade support.

US 6,409,441 B1

DEVICE OF A TOOL SPINDLE

Björn Lind, Billdal, Sweden, assignor to Lind Finance & Development AB, Gothenberg, Sweden

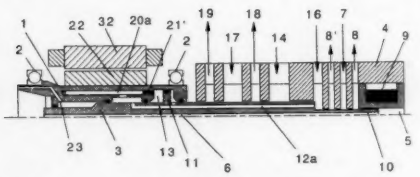
PCT No. PCT/SE00/00101, § 371 Date Sep. 20, 2001, § 102(e) Date Sep. 20, 2001, PCT Pub. No. WO00/59662, PCT Pub. Date Oct. 12, 2000

PCT Filed Jan. 19, 2000, Appl. No. 937,170

Claims priority, application Sweden, Mar. 23, 1999, 9901052

Int. Cl. B23C *1/06;5/28;* **B23Q** *11/12*

U.S. Cl. 409—233 **17 Claims**



1. Arrangement for a tool spindle having a spindle axle with a moveable pulling rod axially displaceable in the spindle axle for firmly attaching a tool, the arrangement comprising:

(a) at least one spool surrounding the pulling rod, the spool being stationary in relation to the pulling rod and providing a specific current flow that differs depending on the axial position of the pulling rod in the spool;

(b) a rotating part of the tool spindle chosen from a group consisting of the spindle axle and an end part of the pulling rod, the rotating part having an axial bore; and

(c) a stationary unit at an end of the tool spindle opposite to the tool, the stationary unit is provided with a cooling fluid inlet for introducing coolant fluid under pressure to the axial bore, the stationary unit and the rotating part defining a gap sealing adjacent to the cooling fluid inlet to allow leakage of fluid through the gap sealing.

US 6,409,442 B1

VERTICAL INTERNAL PUSH BROACHING MACHINE

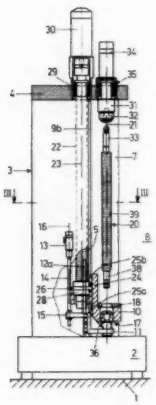
Andreas Berktold, Neuss, and Thomas Grigutsch, Solingen, both of Germany, assignors to Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH & Co. KG, Solingen, Germany

Filed Sep. 5, 2000, Appl. No. 655,308

Claims priority, application Germany, Sep. 4, 1999, 199 42 163

Int. Cl. B23D *37/10*

U.S. Cl. 409—269 **16 Claims**



1. A vertical internal push broaching machine, comprising

a machine column (**3**) having

an upper rail (**4**) and

a back wall (**5**);

carriage guideways (**9***a*, **9***b*) mounted on the back wall (**5**) and disposed in a common vertical plane;

a workpiece lifting table (**10**) displaceably guided on the carriage guideways (**9***a*, **9***b*) in front of the back wall (**5**);

a feeder carriage (**11**) guided for vertical displacement and disposed underneath the lifting table (**10**);

a lifting table drive connecting the machine column (**3**) and the lifting table (**10**);

at least one upper broach holder (**31**) mounted on the rail (**4**);

at least one broach seat (**18**) disposed on the lifting table (**10**) for the accommodation of a workpiece (**19**) which is to broached; and

at least one lower workpiece holder (**17**) mounted on the feeder carriage (**11**),

a workpiece seat (**18**) and an upper broach holder (**31**) and a lower broach holder (**17**) at a time being disposed coaxially of the central longitudinal axis (**21**) of a broach (**18**);

wherein the lifting table drive is formed by a single elevating drive which is disposed behind a plane spanned by the carriage guideways (**9***a*, **9***b*); and

wherein the elevating drive connects the rail (**4**) and the lifting table (**10**).

US 6,409,443 B1

SPRING FASTENER WITH Y-SHAPED CUT AS FUNNEL

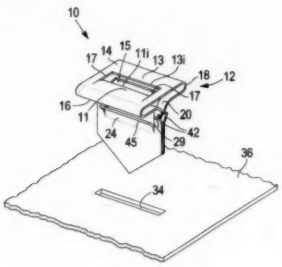
Joseph William Lowry, Libertyville; Michael Anthony Giugliano, Des Plaines; Michael Walter Smith, Lake Zurich, all of Ill., and Eustathios Vassiliou, Newark, Del., assignors to WTPA, Incorporated, Newark, Del.

Provisional application No. 60/234,385, filed on Sep. 20, 2000. This application Oct. 30, 2000, Appl. No. 699,758.

This patent is subject to a terminal disclaimer.

Int. Cl. F16B *13/06;37/04*

U.S. Cl. 411—55 **68 Claims**



1. A spring fastener comprising:

(a) a substantially flat head portion having an upper side, and a lower side, the upper side having a hole through which an expanding member can pass;

(b) a neck having an opening and two side neck portions, the neck extending from the lower side of the substantially flat head portion at a substantially right angle with respect to the substantially flat head portion;

(c) two substantially flat legs extending from the neck, each leg having an inner surface, the two inner surfaces of the two legs being at an initial proximity with each other, the legs being expandable in opposite directions upon inserting through and engaging to the first oblong engageable hole an expanding member, thus bringing the expanding member to a contact region of the legs; and

(d) a Y-shaped funnel in the vicinity of the contact region, the Y-shaped funnel comprising partially cut leg portions extending outwardly from the legs.

US 6,409,444 B2

SELF-PIERCING CLINCH NUT

W. Richard Pamer, Macedonia, and Stanley H. Umbel, Windham, both of Ohio, assignors to R B & W Corporation, Kent, Ohio

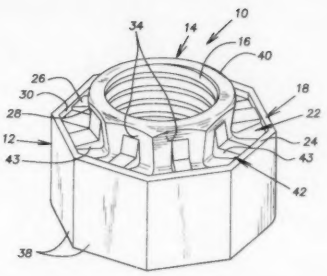
Division of application No. 09/275,309, filed on Mar. 24, 1999, now Pat. No. 6,220,804. This application Mar. 22, 2001, Appl. No. 814,444.

This patent is subject to a terminal disclaimer.

Int. Cl. F16B *37/06*

U.S. Cl. 411—180 **16 Claims**

1. A self-clinching fastener for attachment to a plastically deformable metal panel, said self-clinching fastener comprising a body portion with a central axis and a central punch portion extending from said body portion and coaxial with said central axis, said body portion forming a generally annular-shaped end face adjacent said central punch portion and a groove defined in said end face encircling said central punch portion, said groove having an inclined inner wall forming an undercut and an inwardly extending bottom wall, and a plurality of spaced apart lugs encircling said central punch portion and axially extending from said bottom wall of said groove along substantially the full radial extent thereof, said end face having a lip adjacent an outer periphery of said groove and said lip extending above said lugs, said lugs forming abutments to improve torsional resistance of said fastener.



US 6,409,445 B1

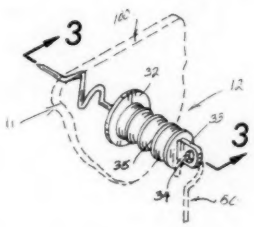
PUSH PIN WITH ROTATABLE ANCHOR SECTION

James R. Beale, 1227 Big Bend Rd., Manchester, Mo. 63021, and Michael A. Prugger, 5532 Duessel La. #A, St. Louis, Mo. 63128

Filed Jan. 24, 2001, Appl. No. 769,042

Int. Cl. F16B *15/00*

U.S. Cl. 411—439 **14 Claims**



1. A push pin construction for releasably engaging at least one sheet of material to a cubicle wall wherein the construction comprises:

a shaft unit including a generally uniform diameter elongated shaft member having a generally straight pointed outboard end aligned with a generally straight inboard end and a helical anchor section formed intermediate said generally straight inboard and outboard ends; and

a head unit including an enlarged push head member fixedly secured to said inboard end of the shaft member.

US 6,409,446 B1

VIBRATION-DAMPING DETACHABLE CONNECTION ARRANGEMENT FOR TWO COMPONENTS WITH A ROTATING BOLT, A RETAINING SPRING AND A VIBRATION-DAMPING RING

Helmut Schwarz, Weil der Stadt, Germany, assignor to Schwarz Verbindungs-Systeme GmbH, Althengstett, Germany

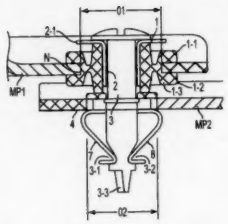
Filed Nov. 22, 2000, Appl. No. 717,159

Claims priority, application Germany, Nov. 23, 1999, 299 20 497 U

Int. Cl. F16B *21/00;21/18*

U.S. Cl. 411—552 **24 Claims**

1. A connection arrangement for the detachable connection of a first and second component with openings to be aligned with each other, the connection arrangement comprising:



a bolt, which is rotatable around its own axis, having a taper toward a free end, and at least two lateral notches, wherein said bolt is adapted for coupling to the first component;

a retaining spring, comprising at least two spring-loaded ends, adapted for coupling to the second component, wherein said spring-loaded ends are arranged to hook into said lateral notches when the first and second components are connected;

at least said lateral notches of said bolt are arranged to project through the opening of the second component;

a vibration-damping ring comprising a peripheral groove adapted to receive an edge of the opening of the first component and a ring opening;

a bush being located in said ring opening and arranged to receive and guide said bolt; and

a movable ring, having an outer diameter that is smaller than a diameter of the opening of the first component and that is larger than a diameter of the opening of the second component, being arranged on said bolt,

wherein, when the first and second components are connected, said movable ring is positioned between a lower side of said vibration-damping ring and an upper side of the second component.

US 6,409,447 B2

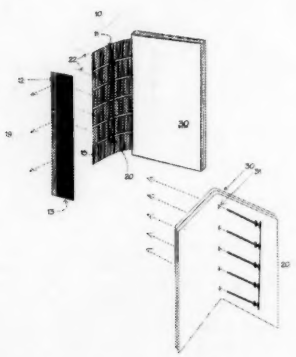
BOOKBINDING SIGNATURE COMB AND SPINE DEVICE

Mark Kent Malmros, Washington Crossing, Pa., assignor to Tanarax, LLC, Washington Crossing, Pa.

Provisional application No. 60/179,936, filed on Feb. 3, 2000. This application Jan. 9, 2001, Appl. No. 756,595.

Int. Cl. B42C *1/00;* **B42B** *9/00*

U.S. Cl. 412—40 **4 Claims**



1. A device for the binding of books in signatures comprising the combination of:

one or more signature combs, each signature comb having a spine and at least two or more teeth attached to, or integral to, the spine, all such teeth on the same plane with each other and the spine and at right angles to a back of spine; further each tooth of the signature comb having at least one tab at a right angle to the tooth and to the signature comb spine;

two or more tapes having teeth arranged in rows transverse to the longitudinal axis of the tape, where the tapes pass between the tabs of the signature comb and a back edge of one or more folded signatures, and forming one or more slots transverse to the spine of the book of a width sufficient to accept the teeth of the signature comb thus securing the signature sheets to the spine of the resulting book by capturing the tapes of each signature comb tooth between and over the back of the tapes;

a pair of hinge elements, each element having two or more pawl slots, corresponding to the number of tapes used, the pawl slots incorporating a rasp element and each slot being the width of the tape or band through which the tapes are inserted so that the rasp elements engage the teeth of the tape or band engaging the tape or band securely to the hinge elements and further securing the signatures together and the pair of hinge elements.

US 6,409,448 B1

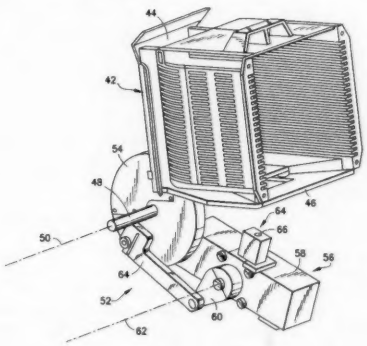
ERGONOMIC LOAD PORT

Glenn L Sindledecker, Dracut, Mass., assignor to Brooks Automation Inc., Chelmsford, Mass.

Filed Apr. 3, 2000, Appl. No. 541,284

Int. Cl. B65G *49/07*

U.S. Cl. 414—222.04 **26 Claims**



1. A system for loading and unloading semiconductor wafers adjacent a process tool comprising:

a platform having an upper surface for receiving thereon a cassette adapted to support therein a plurality of the semiconductor wafers to be passed though a charging opening in communication with the reception region of the process tool, the platform including a cassette cradle and a tilt assembly for moving the cassette cradle with the cassette thereon from a first location at which the semiconductor wafers are supported in a substantially upright orientation to a second location adjacent the reception region into the process tool such that the plurality of wafers are supported in a substantially level orientation;

wherein the cassette cradle includes a base for initially receiving the cassette thereon, an integral back wall extending in a plane transverse to the base, and an arbor pivotally mounting the cassette cradle about an axis parallel to a line of intersection between the base and the back wall for moving the cassette between the first location and the second location whereat the cassette is supported on the back wall;

a selectively operable closure movable between a first position withdrawn from the charging opening allowing the passage therethrough of the semiconductor wafers and a second position overlying the charging opening preventing the passage therethrough of the semiconductor wafers;

a shroud movable between a retracted position fully exposing the platform and the cassette received thereon and an advanced position fully encompassing the platform and the

cassette received thereon adjacent the process tool to serve as a barrier against the passage of particulate matter into the process tool;

a cassette cradle crank interconnecting the cassette cradle and the arbor; and

an actuating mechanism for rotating the cassette cradle crank about the axis of the arbor, the actuating mechanism including a rotary actuator, a drive link driven by the rotary actuator about a drive axis parallel to and spaced from the axis of the arbor, and a connecting link pivotally connected at opposed ends, respectively, to the cassette cradle crank at a position spaced from the arbor axis and to the drive link at a position spaced from the drive axis.

US 6,409,449 B1

COMMISSIONING SYSTEM WITH A HIGH-SPEED AUTOMATIC MACHINE AND A SHELF CONTROL UNIT

Karl Freudelsperger, Hart bei Graz, Austria, and Manfred Preiss, Rosstal, Germany, assignors to Knapp Logistik Automation GmbH, Austria

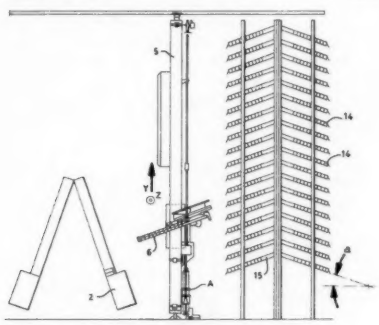
PCT No. PCT/DE99/00847, § 371 Date Nov. 19, 1999, § 102(e) Date Nov. 19, 1999, PCT Pub. No. WO99/47435, PCT Pub. Date Sep. 23, 1999

PCT Filed Nov. 17, 1999, Appl. No. 424,284

Claims priority, application Germany, Mar. 20, 1998, 198 12 147

Int. Cl. B65G *1/04*

U.S. Cl. 414—276 **16 Claims**



1. A commissioning unit, comprising:

a high-speed automatic turning unit having an article bay with sloping article shafts, said article shafts being arranged next to one another, said article shafts being accessible from a front side and said article shafts defining a space in which articles to be commissioned can be stored;

a traveling bay-storage and retrieval unit associated with said article bay for loading articles into said article shaft, said bay-storage and retrieval unit having motive means and being movable at least longitudinally and having an article-handling unit, said article-handling unit loading articles of a same brand and dimension stack by stack without a magazine, wherein a stack of the articles to be loaded is handled by said bay-storage and retrieval unit simultaneously without said magazine and said article-handling unit has a powered pick up means for bottom-side stack-of-articles pick-up, an adjustable longitudinal stack-of-articles pusher, an adjustable transverse stack-of-articles pusher with motive means therefor to move the stack into the space where the articles are stored and an adjustable longitudinal stack-of-articles powered clamping plate provided with a row of spring-tensioned fingers, said clamping plate being located in parallel and opposite said stack-of-articles pick-up and pushes, in a clamped state, the stack of articles picked up directly by said longitudinal stack-of-articles clamping plate with said spring-tensioned fingers of said clamping plate, in a transverse direction of the stack of articles against the stack-of-articles pick-up.

US 6,409,450 B1

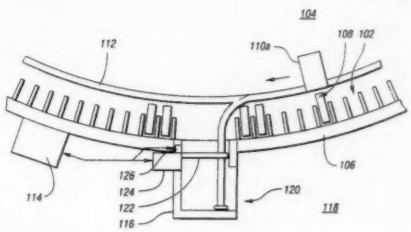
LIBRARY SERVICE PORT

Timothy C. Ostwald, Louisville, and Daniel James Plutt, Superior, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Jan. 12, 2000, Appl. No. 481,901

Int. Cl. B65G *65/00*

U.S. Cl. 414—277 **11 Claims**



1. A data storage library comprising:

a housing defining an exterior and an interior region;

a robotic mechanism disposed in the interior region;

a plurality of storage cells disposed in the interior region for storing data cartridges;

a service port disposed through the housing for permitting access to at least part of the robotic mechanism from the exterior region; and

a door disposed across the service port, the door having a closed position for disabling access to the interior region from the exterior region and an open position for enabling access to the at least part of the robotic mechanism from the exterior region, wherein the door opens automatically to enable access to the at least part of the robotic mechanism, and wherein access to the interior region is automatically disabled when access to the at least part of the robotic mechanism is enabled.

US 6,409,451 B1

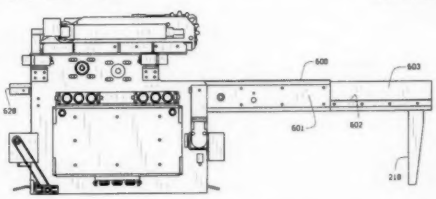
ITEM HANDLER AND METHOD FOR FLOW THROUGH STORAGE

Larry W. Fallin, Dakota Dunes, S. Dak.; Barbara J. Scalia, Sioux City, Iowa; Ronald D. Smith, McCook, S. Dak.; James F. Dill, Foxboro, Mass.; Timothy J. Mason, Uxbridge, Mass.; Edward M. Kolvek, West Newbury, Mass.; Stephen N. Forti, Stoneham, Mass.; Roland H. Estey, III, Concord, Mass.; James R. Downer, Canton, Mass.; Carl Brian Candiloro, Waltham, Mass., and Andrew S. Courier, Mansfield, Mass., assignors to IBP, Inc., Dakota Dunes, S. Dak.

Filed Apr. 13, 2000, Appl. No. 548,974

Int. Cl. B65G *1/00;47/26;* **G06F** *7/00*

U.S. Cl. 414—282 **27 Claims**

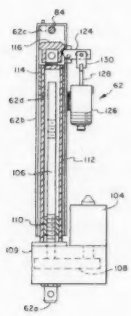


2. A remote vehicle for handling items to be stored and retrieved from a storage facility comprising:

a) an upright chassis frame having a pair of elongated vertically oriented frame members, said vertically oriented frame members disposed at opposing ends of the chassis frame, having a pair of respective upper and lower portions and having an interior hollow volume and said pair of vertically oriented frame members are connected at their respective upper portions by a rigid bridge frame member;

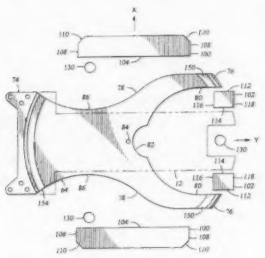
b) a pair of elevator lift systems housed in the hollow interior of each of the pair of vertically oriented frame members;
c) a plurality of track wheels each operatively attached to the bridge frame member of said chassis by an axle member;
d) an over-head track rail system adapted to engage the plurality of track wheels and freely suspend the chassis from said overhead track rail and said track wheels adapted to translate on said track rail and said track rail system having a power rail source adapted to conduct electrical power over the track rail to the remote vehicle;
e) a carriage having a horizontal platform and a pair of opposing vertically oriented side walls each operatively connected to one of the pair of elevator lift systems such that the carriage is lifted and lowered by the elevator lift system;
f) a mechanical arm adapted to extend substantially horizontal from said carriage over an item and transfer said item onto and off of the horizontal platform of the carriage; and
g) an on-board controller in operative communication with the elevator lift system and the mechanical arm and adapted to selectively control the elevator and arm for controlling transfer of items on and off the carriage platform and elevating the platform to the desired height,
wherein the freely suspended remote vehicle does not require dedicated floor space for operation.

US 6,409,452 B1
ELECTRICALLY ACTUATED VEHICLE RESTRAINT APPARATUS
Michael A. Zibella, Hudson; Mark S. Lounsbury, Wassaic, both of N.Y.; David P. Bresson, North Canton, Ohio, and George D. Quinlan, Valatie, N.Y., assignors to Overhead Door Corporation, Dallas, Tex.
Filed Jul. 12, 2000, Appl. No. 614,352
Int. Cl. B65G *67/02*
U.S. Cl. 414—401 **23 Claims**



1. A vehicle restraint apparatus comprising:
a frame;
an arm assembly supported on said frame and movable between a retracted stored position and an extended position;
an electric actuator operable to move said arm assembly from said stored position to said extended position for engagement with a vehicle to restrain same, said actuator including a first actuator member connected to said arm assembly and a second actuator member, said actuator members being movable relative to each other to provide for retraction of said second actuator member after extension of said arm assembly to allow movement of said arm assembly relative to said frame; and
a mechanism operable to provide a releasable connection between said actuator members to provide for retracting said first actuator member and said arm assembly toward said stored position.

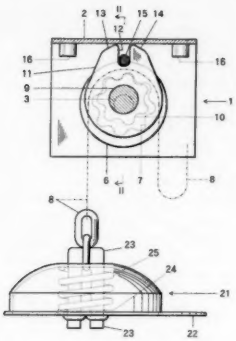
US 6,409,453 B1
END EFFECTOR FOR WAFER HANDLER IN PROCESSING SYSTEM
Jeff Brodine, Los Gatos, and Dan Marohl, San Jose, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.
Continuation of application No. 09/025,320, filed on Feb. 18, 1998, now abandoned. This application Jun. 6, 2000, Appl. No. 588,616.
Int. Cl. B65B *49/07*
U.S. Cl. 414—416 **16 Claims**



1. A vacuum processing system, comprising:
a first chamber;
at least one second chamber cooperatively engaged with the first chamber;
a wafer handler disposed within the first chamber; and
an end effector having:
a fixed end attached to the wafer handler and a free end;
a first wafer support proximate to the fixed end and having opposing edges;
two wafer end supports spaced apart and proximate to the free end, the wafer end supports having opposing edges wider than the opposing edges of the first wafer support, the first wafer support and the two wafer end supports having at least one end shoe adapted to capture the wafer laterally between the two wafer end supports and the first wafer support and each wafer end support adapted to support a bottom side of a wafer;
a wafer sense cutout;
an end recess between the two wafer end supports; and
a first side recess and a second side recess disposed between at least the first wafer support and the two wafer end supports on opposing sides of the end effector.

US 6,409,454 B1
SUSPENDING MEMBER BREAKAGE PREVENTING MECHANISM IN SPARE WHEEL HOLDING APPARATUS
Tomio Yamamoto, Aichi-ken, Japan, assignor to Sankokiki Kabushiki Kaisha, Aichi-Ken, Japan
Filed Jun. 6, 2000, Appl. No. 587,897
Claims priority, application Japan, Jun. 17, 1999, 11-170774
Int. Cl. B66D *1/58*
U.S. Cl. 414—463 **8 Claims**

1. A spare wheel holding apparatus adapted to prevent breakage of a suspending member, said apparatus comprising:
a wheel support member for supporting a wheel;
a suspending member having a falling end that connects to the wheel support member;
a winding device for winding up the suspending member, said winding device comprising:
a case;
a main shaft that is supported on the case;
a winding drum rotatably fitted to the main shaft, the winding drum being adapted to wind-up the suspending member; and
a planetary gear mechanism comprising: an internal gear comprising a plurality of internal gear teeth arranged concentrically with the main shaft on a side of the winding drum; an



eccentric cam formed as a single body with the main shaft and being eccentrically disposed with respect to the main shaft said cam having an external gear rotatably fitted concentric with the eccentric cam and intermeshing with the internal gear, the external gear having a plurality of teeth less than the number of internal gear teeth so that a large reduction ratio is obtained;

a rotation restricting plate joined to the winding drum and having a circumferential surface that is concentric with the main shaft; and

a rotation restricting pin adapted to be placed through the case so the rotation restricting plate abuts the rotation restricting pin, thereby preventing movement of the winding drum when the rotation restricting pin is placed through the case, and permitting the winding drum to rotate when the rotation restricting pin is removed from the case;

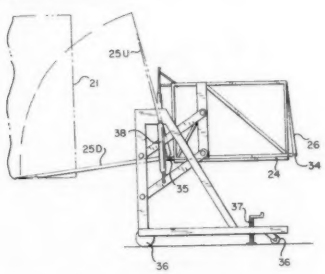
wherein the rotation restricting pin is adapted to break and allow rotation of the winding drum and payout of the suspending member, thereby preventing breakage of the suspending member, when a winding-off force in excess of a predetermined force is applied to the suspending member.

US 6,409,455 B2

WHEELED ELEVATOR FOR TRANSFERRING FREIGHT INTO OR OUT OF AN ENCLOSED TRUCK

John F. Moseley, Ormond Beach, Fla., assignor to Superior Handling Equipment, Inc., Ormond Beach, Fla.

Filed Feb. 23, 2000, Appl. No. 511,297
Int. Cl. B65G *69/32*
U.S. Cl. 414—495 **20 Claims**



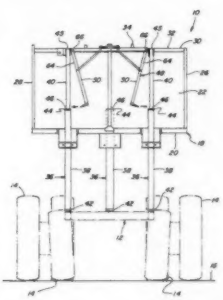
1. A movable wheeled apparatus for transferring freight between a high level and a low level to and from a truck and a conveyor for transferring freight between the high and the low level to and from the truck, said movable wheeled apparatus comprising a base frame structure moving on the low level, an elevatable platform pivotally coupled to said base frame structure for receiving a load from the high or the low level, lifting means for lifting said elevatable platform between the low level and the high level, said elevatable platform including first and second access ramps hingedly connected to said elevatable platform, said first access ramp being extended when said platform is at the high level, said second access ramp being extended when said platform is at the low level, and said first access ramp having a base portion, an intermediate portion and a forward end portion, wherein said first access ramp includes first and second sides, said first side having a part offset inwardly toward a centerline of said elevatable platform, and said second side having a part offset outwardly away from said centerline to permit simultaneous loading and unloading of the truck by transfer means operating on said elevatable platform of said movable wheeled apparatus and the conveyor adapted to be located between said second side and a sidewall of the truck.

US 6,409,456 B1

APPARATUS FOR RAISING AND LOWERING A LID STRUCTURE OF A COTTON RECEIVING BASKET OF A COTTON HARVESTER

Michael J. Horejsi, Sherrard, Ill., and Travis A. Schaeffer, Davenport, Iowa, assignors to Case Corporation, Racine, Wis.

Provisional application No. 60/260,513, filed on Jan. 9, 2001.
This application May 9, 2001, Appl. No. 852,216.
Int. Cl. A01D *90/12*
U.S. Cl. 414—495 **15 Claims**



1. In a cotton harvester including a mobile frame supporting a basket for receiving cotton, the basket having an upstanding wall structure defining an upwardly facing opening, a lid structure disposed over the opening and positionable in a retracted position close to the wall structure and in an extended position spaced a predetermined distance above the wall structure, and at least one lifting element having a member extendable for lifting the basket relative to the frame to a lifted position and retractable for lowering the basket from the lifted position, the improvement comprising:

a leg mounted to the lid structure and engageable with a portion of the lifting element when the basket is in the lifted position and the lid structure is in the retracted position so as to hold the lid structure stationary relative to said portion of the lifting element while the basket is lowered from the lifted position to locate the lid structure in the extended position.

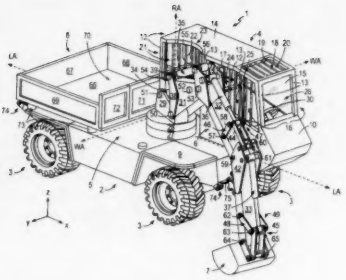
US 6,409,457 B1

WORK VEHICLE

George Korycan, 9709 S. Seeman Rd., Union, Ill. 60180, and Libor Belohoubek, Rooseveltova 28, 164 00 Prague 6, Czechoslovakia

Filed Oct. 15, 1999, Appl. No. 418,634
Int. Cl. B60P *1/04;1/54*
U.S. Cl. 414—501 **51 Claims**

1. A vehicle for operation with a load, the vehicle comprising:



a chassis having a longitudinal axis symmetrically dividing the chassis through its middle;

a cabin fixedly mounted on a first side of the longitudinal axis of the chassis on a forward portion thereof;

a plurality of wheels coupled to the chassis, including front and rear wheels, to movably support the chassis;

a boom unit;

a tool coupled to an end of the boom unit;

a turntable unit fixedly mounted to the chassis at a central portion thereof on the longitudinal axis, the turntable unit separate from said cabin and spaced along the longitudinal axis from said front and rear wheels, the turntable unit coupled to and supporting the boom unit for rotation; and

a dump body-mounted to a rear portion of the chassis, the dump body having a floor portion and faces for containing the load,

the turntable capable of moving the boom unit and tool with the load over a second side of the chassis opposite the first side between a first position at which the tool and load are positioned forward of the chassis and a second position at which the tool and load are positioned over the dump body.

US 6,409,458 B1

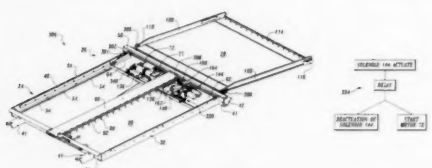
LOW FLOOR VEHICLE RAMP ASSEMBLY

Alan R. Cohn, Lockeford; Cleatus A. Lewis, Modesto, and Curtis J. Simon, Pine Grove, all of Calif., assignors to Lift-U, Division of Hogan Mfg., Inc., Escalon, Calif.

Continuation of application No. 09/164,434, filed on Sep. 30, 1998, now abandoned, which is a continuation-in-part of application No. 09/060,948, filed on Apr. 15, 1998, now Pat. No. 6,186,733. This application May 2, 2000, Appl. No. 563,774.

Int. Cl. B60P *1/43*

U.S. Cl. 414—537 **14 Claims**



13. A ramp assembly comprising:

(a) a frame;

(b) a ramp platform mounted in the frame defining trailing and forward ends and extendible and retractable along a length of the frame between stowed and deployed positions, the ramp platform being arranged when deployed such that the forward end extends down toward the ground;

(c) a first locking mechanism that locks the ramp platform into a fully deployed position, wherein the first locking mechanism comprises a first latch plate attached to the frame and a first latch arm operatively associated with the ramp platform to extend and retract with the ramp platform and configured and arranged so as to engage and lock onto the first latch plate when the ramp platform is in the fully deployed position;

(d) a second locking mechanism that locks the ramp platform into a fully stowed position, wherein the second locking mechanism comprises a stowed latch plate attached to the frame that is engaged by and locked onto by a second latch arm when the ramp platform is in the fully stowed position;

(e) a solenoid actuator operatively associated with the first and second latch arms so that actuation of the solenoid actuator disengages the first latch arm from the first latch plate in the fully deployed position, and disengages the second latch arm from the stowed latch plate in the fully stowed position;

(f) a reciprocating mechanism for extending and retracting the ramp platform along a length of the frame between stowed and deployed positions; and

(g) a time delay circuit, the time delay circuit configured to delay the actuation of the reciprocating mechanism until after actuation of the solenoid actuator, so that the first latch arm is fully disengaged from the first latch plate before actuation of the reciprocating mechanism in the fully deployed position, and so that the second latch arm is fully disengaged from the stowed latch plate before actuation of the reciprocating mechanism in the fully stowed position.

US 6,409,459 B1

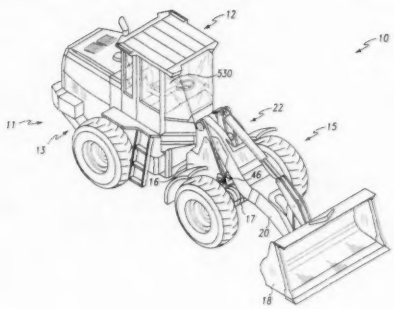
LINKAGE ASSEMBLY FOR CONNECTING A WORK IMPLEMENT TO A FRAME OF A WORK MACHINE

Ronald Mark Ginn, Cary; Dana D. Branham, Raleigh, and Keith L. Stanley, Shallotte, all of N.C., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jan. 30, 1998, Appl. No. 16,738

Int. Cl. B66C *23/00*

U.S. Cl. 414—685 **17 Claims**



1. A linkage assembly for connecting an implement to a frame of a work machine, comprising:

a box-boom lift arm having a frame end portion and an implement end portion, wherein (i) said frame end portion is pivotally couplable to said frame, (ii) said implement end portion is pivotally couplable to said implement, and (iii) said frame end portion includes a first extension and a second extension spaced apart from each other so as to define a first lever space therebetween;

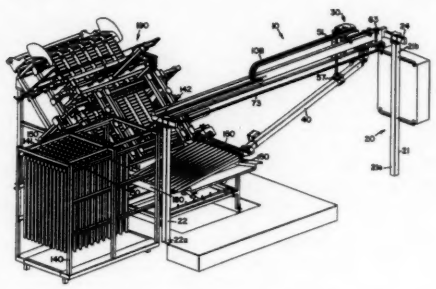
a lift cylinder having a frame end and a lift arm end, wherein (i) said frame end is pivotally couplable to said frame, and (ii) said lift arm end is pivotally coupled to said box boom lift arm;

a rear tilt link having a first end and a second end, wherein said first end is pivotally couplable to said frame;

a rear tilt lever having a cylinder end and a link end, wherein (i) said link end is pivotally coupled to said second end of said rear tilt link, (ii) said rear tilt lever is pivotally coupled to said box boom lift arm at a location which is interposed between said cylinder end and said link end, and (iii) said rear tilt lever extends through said first lever space; and

a tilt cylinder having a lever end and an implement end, wherein (i) said lever end is pivotally coupled to said cylinder end of said rear tilt lever and (ii) said implement end is mechanically couplable to said implement.

US 6,409,460 B1
RACK UNLOADER
Lyndon R. Leining, Austin, Minn., assignor to Hormel Foods, LLC, Austin, Minn.
Filed Apr. 7, 2000, Appl. No. 545,812
Int. Cl. B66F *11/00*
U.S. Cl. 414—745.9 **10 Claims**



1. An apparatus for unloading a rack, having a plurality of bars, each bar having a plurality of pepperoni sticks attached thereto, the apparatus comprising:

a) a support arm operatively connected to a support;

b) a first motor operatively connected to a sliding mechanism mounted on the support arm for moving the sliding mechanism between first and second positions;

c) a pick-up arm having first and second ends, the sliding mechanism operatively connected to the pick-up arm proximate the first end;

d) a lifting bar operatively connected to the second end of the pick-up arm; and

e) a lifting mechanism carried by the sliding mechanism, the lifting mechanism operatively connected to the pick-up arm to move the second end of the pick-up arm vertically, wherein the lifting bar is indexed into the rack by the sliding mechanism from the first position to the second position and lifts the bar having the pepperoni sticks and removes the bar from the rack.

US 6,409,461 B1
METHOD AND APPARATUS FOR STACKING TORTILLA CHIPS
Patrick J. Bierschenk, Dallas; Steven D. Braithwaite, Allen, and John J. Michels, Highland Village, all of Tex., assignors to Recot, Inc., Pleasanton, Calif.
Division of application No. 09/326,682, filed on Jun. 7, 1999, now Pat. No. 6,338,606. This application Dec. 12, 2001, Appl. No. 12,308.
Int. Cl. B65G *57/16*
U.S. Cl. 414—788.2 **7 Claims**

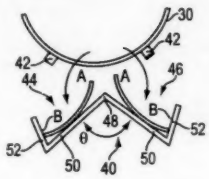
1. An apparatus for segregating and stacking for subsequent packaging a succession of curved, generally triangular chips, the apparatus comprising:

a first, vibratory, generally U-shaped conveyor chute for transporting the chips and having an upstream end and a downstream end;

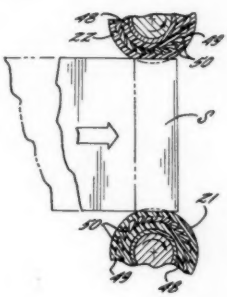
a second, generally W-shaped conveyor chute comprising two troughs, said second conveyor chute having an upstream end and a downstream end, the upstream end of the second conveyor chute being positioned to receive chips from the downstream end of the first conveyor chute and configured to receive chips into either of said troughs for transport thereby;

means for rotating the chips by about 120° in a plane about their centers of gravity;

two accumulator conveyors which automatically accumulate and stack the chips in a nested, stacked arrangement, each of the two accumulators being positioned to receive chips from one of the two troughs of the W-shaped conveyor chute.



US 6,409,462 B2
METHOD FOR ALIGNING STACKED DOCUMENTS MOVING ALONG A CONVEYOR
John Robert Newsome, 15987 N. 700th St., Shumway, Ill. 62461, and Kenneth Jerome Polarek, 1009 Cardinal Dr., Effingham, Ill. 62401
Division of application No. 09/434,717, filed on Nov. 5, 1999. This application Jan. 3, 2001, Appl. No. 753,522.
Int. Cl. B65G *57/11*
U.S. Cl. 414—788.9 **10 Claims**



1. A method of forming and conveying stacks of documents, comprising the steps of

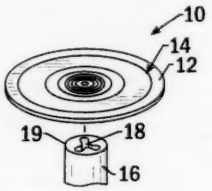
forming a stack of documents,

ejecting the stack of documents onto a longitudinally extending conveyor so that the stack moves longitudinally onto the conveyor at a predetermined speed,

engaging the opposite sides of the ejected stack by a pair of rotating guide rolls while the stack moves along the conveyor, and with the guide rolls rotating about their respective axes at a peripheral speed which closely approximates the predetermined speed of the stack, and then

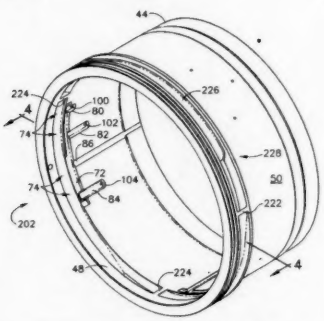
reducing the rotational speed of the guide rolls while the rolls are in engagement with the stack and so as to decelerate the stack.

US 6,409,463 B1
APPARATUSES AND METHODS FOR ADJUSTING A SUBSTRATE CENTERING SYSTEM
Brett J. Croft, and Michael Huston, both of Vancouver, Wash., assignors to SEH America, Inc., Vancouver, Wash.
Filed Feb. 8, 2000, Appl. No. 500,399
Int. Cl. B65G *49/07*
U.S. Cl. 414—936 **16 Claims**



1. An apparatus for use in adjusting a substrate centering system to center a substrate on a rotatable chuck in a semiconductor processing machine, the chuck including at least one reference point, the apparatus comprising a plate configured to be placed on the chuck; and at least one centering mark formed on the plate; wherein the at least one centering mark is configured so that it may be compared to the at least one reference point on the chuck to determine if the plate is centered, said plate further configured to be removed from the chuck following adjustment of the substrate centering system and prior to operation of the semiconductor processing machine.

US 6,409,464 B1
METHODS AND APPARATUS FOR SUPPLYING OIL TO BEARING ASSEMBLIES
Kenneth Lee Fisher, Lockland; Herbert Franz Demel, West Chester, and Rodney Hazeley, Cincinnati, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.
Filed Jun. 30, 2000, Appl. No. 607,755
Int. Cl. F01D *25/16*
U.S. Cl. 415—1 **20 Claims**



1. A method for lubricating a bearing assembly using a lubrication system, the bearing assembly supporting a first rotor shaft having an axis of symmetry, the lubrication system including a second rotor shaft mounted concentrically around the first rotor shaft and including an inner surface and an outer surface, the inner surface including a plurality of first grooves extending axially from at least one second groove, the second groove substantially perpendicular to the plurality of first grooves, the first grooves in flow communication with the bearing assembly, said method comprising the steps of:

supplying oil to at least one second rotor shaft second groove,

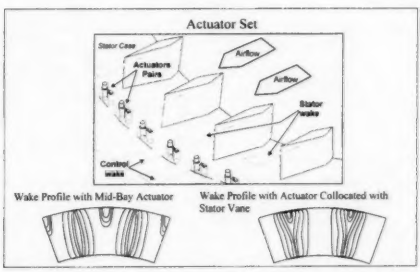
channeling the oil circumferentially along a portion of an inner circumference of the second rotor shaft;

channeling the oil from the second rotor shaft second groove through the plurality of second rotor shaft first grooves; and

channeling the oil from at least one second rotor shaft first groove to the bearing assembly through at least one opening that extends between the second rotor shaft inner and outer surfaces.

6. A lubrication system for a gas turbine engine including a first rotor shaft and an axis of symmetry, said lubrication system comprising a second rotor shaft concentrically around said first rotor shaft, said second rotor shaft comprising an inner surface and an outer surface, said inner surface comprising a plurality of first grooves and at least one second groove, said plurality of first grooves in flow communication with and extending axially from said at least one second groove, said at least one second groove substantially perpendicular to said plurality of first grooves and extending partially circumferentially through said inner surface, at least one of said plurality of first grooves comprising an opening extending between said second rotor shaft inner surface and said second rotor shaft outer surface.

US 6,409,465 B1
BLADE VIBRATION CONTROL IN TURBO-MACHINERY
Andreas von Flotow, Hood River, Oreg., and George Zipfel, Summit, N.J., assignors to Hood Technology Corporation, Hood River, Oreg.
Provisional application No. 60/151,568, filed on Aug. 31, 1999. This application Aug. 29, 2000, Appl. No. 650,294.
Int. Cl. F01D *00/00*
U.S. Cl. 415—1 **13 Claims**



1. A method for reducing blade vibration in turbo-machinery comprising the step of:

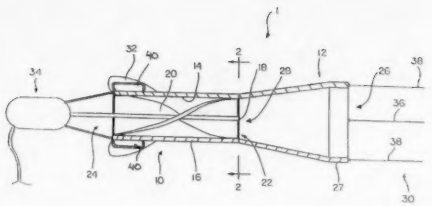
placing physical or mechanical obstructions upstream of vibrating blades in turbo-machinery in a manner so that power flow into said vibrating blades reduces blade vibrations by means of cancellation within a modal power integrally, wherein said modal power integral is the product of pressure at a blade surface times velocity of said blade perpendicular to said blade surface, and

wherein said obstructions are selected from the group consisting of flow obstructions, gas injections and combinations of flow obstructions and gas injections.

US 6,409,466 B1
HYDRO TURBINE
John S. Lamont, 30th Floor-360 Main Street, Winnipeg Manitoba, Canada, R3C 3Z3
Filed Aug. 25, 2000, Appl. No. 645,314
Int. Cl. F03B *13/12*
U.S. Cl. 415—3.1 **20 Claims**

1. A water driven turbine for converting the energy of an underwater current comprising:

a hollow tubular open ended housing, said housing having an entry end for accepting the water and an exit end for releasing the water;



a shaft mounted within the housing, said shaft arranged to rotate within the housing about an axis of rotation;

connection means on the shaft for operably linking the shaft to a generator such that rotation of the shaft generates electrical power;

blade means arranged about the shaft, said blade means extending along a length of the shaft;

a funnel mounted onto the entry end of the housing, said funnel having a mouth and a discharge, said mouth having a diameter greater than the diameter of the housing, said discharge having a diameter approximately equal to the diameter of the housing; and

tether means mounted on the funnel for stabilizing the water driven turbine;

wherein the discharge of the funnel is mounted onto the entry end of the housing such that the water entering the funnel at the mouth passes through the housing and contacts the blade means, thereby rotating the shaft and generating electrical power.

US 6,409,467 B1

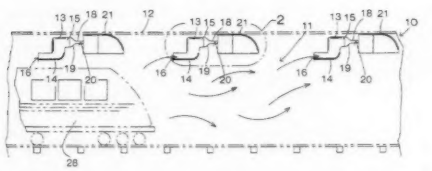
WIND-GENERATED POWER SYSTEM

Howard Gutterman, P.O. Box 230881 Ansonia Station, New York, N.Y. 10023

Filed Mar. 9, 2001, Appl. No. 802,574

Int. Cl. F03D *1/00;* **H02P** *9/04*

U.S. Cl. 415—4.3 **7 Claims**



1. A wind-generated power system comprising:

a subway system tunnel having a wall and support structure with wind being generated by subway trains passing or traveling at high rates of speed therethrough;

wind-collecting ducts being spaced throughout said subway system tunnel and being attached to the wall and support structure, each of said wind-collecting ducts including a wind intake opening and a wind outlet opening, and also including a venturi disposed near said wind outlet opening to accelerate the wind being collected through said wind intake opening, each said venturi being generally a funnel having a constricted passageway through which the wind is accelerated upon leaving said wind-collecting duct, each of said wind-collecting ducts being generally sinusoidal-shaped having a wind intake portion being disposed in said subway system tunnel, and further having a wind outlet portion being disposed upon the wall and support structure;

shrouds being mounted to the wall and support structure and being connected to said wind-collecting ducts, each of said shrouds including a front wall and a bottom wall, and also including a hole being disposed through said front wall and an opening being disposed through said bottom wall, said funnels being disposed upon said holes in said front walls of said shrouds, said shrouds being disposed upon the wall and support structure with said openings in said bottom walls being disposed upon the wall and support structure; and

turbine generators being mounted in said shrouds and being adapted to transform wind to electrical power, said wind turbine generators including support members and turbine members which are securely mounted upon said support members and which are disposed in said shrouds to effectively rotate upon the wind being accelerated into said shrouds through said funnels.

US 6,409,468 B1

TURBO-MOLECULAR PUMP

Hiroyuki Kawasaki, Tokyo, Japan, assignor to Ebara Corporation, Tokyo, Japan

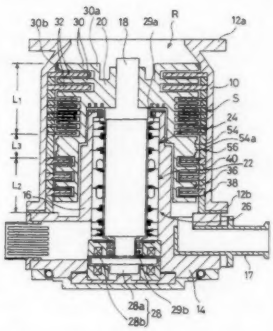
PCT No. PCT/JP99/03524, § 371 Date Sep. 29, 2000, § 102(e) Date Sep. 29, 2000, PCT Pub. No. WO00/00746, PCT Pub. Date Jan. 6, 2000

PCT Filed Jun. 30, 1999, Appl. No. 647,466

Claims priority, application Japan, Jun. 30, 1998, 10-199668

Int. Cl. F04D *1/04*

U.S. Cl. 415—71 **9 Claims**



1. A turbo-molecular pump comprising:

a casing, said casing containing an exhaust vane section including vanes, the vanes further comprising rotary vanes on a rotor section alternating with stationary vanes on a stator section,

wherein said exhaust vane section comprises an axial exhaust vane section and a radial exhaust vane section disposed downstream of said axial exhaust vane section;

wherein a screw groove exhaust section is provided at an upstream location of said radial exhaust vane section for delivering gases to said radial exhaust vane section by means of screw grooves.

US 6,409,469 B1

FAN-STATOR INTERACTION TONE REDUCTION

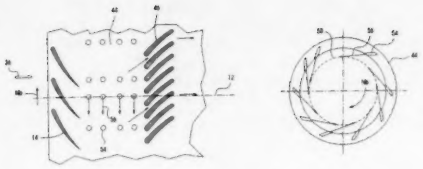
Man-Chun Tse, Brossard, Canada, assignor to Pratt & Whitney Canada Corp., Longueuil, Canada

Filed Nov. 21, 2000, Appl. No. 716,454

Int. Cl. F01D *5/10;* **F04D** *29/38*

U.S. Cl. 415—119 **14 Claims**

1. A method for reducing rotor-stator interaction tones in an annular duct surrounding a plurality of circumferentially spaced rotor blades and a plurality of circumferentially spaced stator vanes axially spaced apart from the rotor blades, the annular duct including an inlet for receiving air and an outlet for discharging at least a portion of the air compressed by the rotor blades, comprising a step of proving a controlled air blowing system for blowing an air flow in a direction opposite to the rotation of blade-wakes into the



annular duct between the rotor blades and the stator vanes to impart an opposite rotational momentum with respect to the air compressed by the rotor blades, thereby reducing the strength of a spinning mode generated by a symmetrical pattern of the blade rotation-wakes of the compressed air.

6. A gas turbine engine fan assembly comprising:

a plurality of circumferentially spaced rotor blades;

a plurality of circumferentially spaced stator vanes axially spaced apart from the rotor blades;

an annular duct surrounding the rotor blades and stator vanes, and having an inlet for receiving air and an outlet for discharging at least a portion of the air upon compression by the blades; and

means for blowing an air flow in a direction opposite to the rotation of blade-wakes into the annular duct between the rotor blades and the stator vanes to impart an opposite rotational momentum with respect to the air compressed by the rotor blades, thereby reducing the strength of a spinning mode generated by a symmetrical pattern of the blade rotation-wakes of the compressed air.

US 6,409,470 B2

TIP TREATMENT BARS IN A GAS TURBINE ENGINE

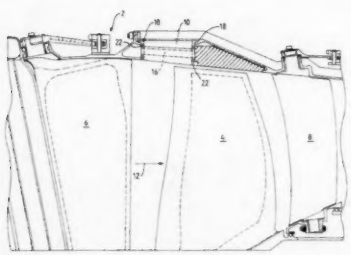
Peter Allford, and Mark J. Houle, both of Bristol, United Kingdom, assignors to Rolls-Royce, PLC, London, United Kingdom

Filed May 15, 2001, Appl. No. 854,593

Claims priority, application United Kingdom, Jun. 6, 2000, 0013772

Int. Cl. F01D *25/04*

U.S. Cl. 415—119 **27 Claims**



1. A gas turbine engine casing comprising:

oppositely disposed annular end supports;

a plurality of tip treatment bars having opposite ends, each bar being supported at each end by the end supports; and

damping means provided at at least one end of each bar, the damping means isolating the bar from the respective end support.

US 6,409,471 B1

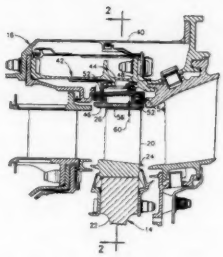
SHROUD ASSEMBLY AND METHOD OF MACHINING SAME

Jonathan J. Stow, Hamilton, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 16, 2001, Appl. No. 785,765

Int. Cl. F01D *11/08*

U.S. Cl. 415—173.1 **17 Claims**



1. A method of machining an inner surface of a shroud assembly extending generally circumferentially around a central axis of a gas turbine aircraft engine, said engine including a disk mounted inside the shroud assembly for rotation about the central axis of the engine and a plurality of circumferentially spaced rotor blades extending generally radially outward from an outer diameter of the disk, each of said blades extending from a root positioned adjacent the outer diameter of the disk to a tip positioned outboard from the root, said method comprising:

determining a pre-machined radial clearance between the tips of said plurality of rotor blades and the inner surface of the shroud assembly during flight of said aircraft engine at each of a plurality of circumferentially spaced locations around the shroud assembly; and

machining said inner surface of the shroud assembly based on said pre-machined radial clearances to provide a uniform post-machined radial clearance during flight between the tips of said plurality of rotor blades and the inner surface of the shroud assembly at each of said plurality of circumferentially spaced locations around the shroud assembly.

7. A shroud assembly for use in a gas turbine engine, extending generally circumferentially around a central axis of the gas turbine aircraft engine and surrounding a plurality of blades rotatably mounted in the engine, each of said blades extending outward to a tip, said shroud assembly comprising an inner surface extending generally circumferentially around the engine and outside the tips of said plurality of blades when the shroud assembly is mounted in the engine, said inner surface having a radius which varies circumferentially around the central axis of the engine before flight but which is substantially uniform during flight to minimize operating clearances between the inner surface and the tips of said plurality of blades.

US 6,409,472 B1

STATOR ASSEMBLY FOR A ROTARY MACHINE AND CLIP MEMBER FOR A STATOR ASSEMBLY

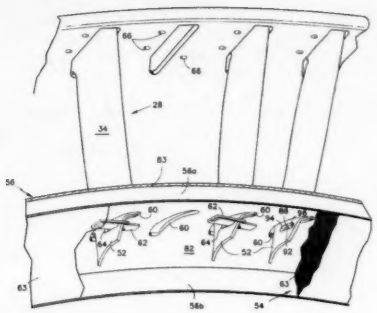
Michael E. McMahon, Shapleigh; Robert B. Richardson, Kennebunk; Steven J. Feigleson, Falmouth, all of Me.; Keith T. Honda, Ellington, Conn.; Christopher G. Demers, Willington, Conn.; Michael A. Servadio, Tolland, Conn., and Kevin A. Walton, Manchester, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Provisional application No. 60/147,978, filed on Aug. 9, 1999. This application Jul. 31, 2000, Appl. No. 629,306.

Int. Cl. F01D *9/04*

U.S. Cl. 415—189 **16 Claims**

4. A clip member for a stator vane of a stator assembly of a rotary machine which has an installed condition in the rotary machine, the clip member having a base and a retention member



which extends from the base and which is spaced from the base leaving a gap therebetween which is adapted to receive the stator vane and which adapts the clip member to engage the stator vane with the retention member and the base, the retention member being a spring member having material properties such that the retention member presses the base against the stator vane in the installed condition and such that the clip member is spaced from a radial end portion of the stator vane.

US 6,409,473 B1

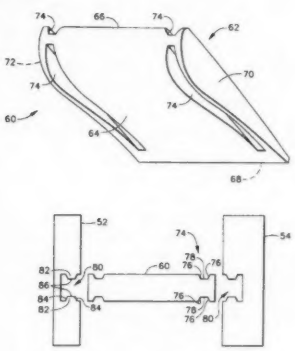
LOW STRESS CONNECTION METHODOLOGY FOR THERMALLY INCOMPATIBLE MATERIALS

E-June Chen, Scottsdale; Bjoern Schenk, Phoenix; Ramesh Bapat, Mesa; I. Gene Fowkes, Tempe; Brian Gracias, Phoenix; Shen-Yeh Chen; Taison Ku, both of Tempe, and Josef Paluch, II, Avondale, all of Ariz., assignors to Honeywell International, Inc., Morris Township, N.J.

Filed Jun. 27, 2000, Appl. No. 604,386

Int. Cl. F01D *1/02*

U.S. Cl. 415—191 **8 Claims**



1. A bicast assembly comprising:

a ceramic member bounded by a leading edge, a trailing edge, and first and second edges extending from the leading edge to the trailing edge, said first and second edges having dovetail grooves forming a dogbone shape;

a first and second metal walls spaced apart, each of said walls having a first and second groove, respectively, said first and second groove having protrusions forming a dogbone shape; and

said first and second shapes selected so that when said first and second walls are bicast around said first and second edges respectively, at least one surface of said first and second edges contacts at least one surface of said first and second grooves respectively.

US 6,409,474 B1

CENTRIFUGAL PUMP FORMED BY PRESSING AND WELDING AND ITS MANUFACTURING PROCESS

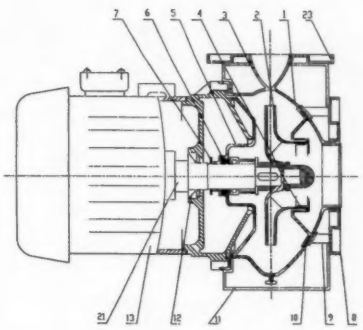
Fang Liang, Northern of Yangjiang, China, assignor to Yangjiang New Yuehua Stainless Steel Pump Co. Ltd., Guandong, China

PCT No. PCT/CN98/00261, § 371 Date Aug. 25, 2000, § 102(e) Date Aug. 25, 2000, PCT Pub. No. WO00/26541, PCT Pub. Date May 11, 2000

PCT Filed Oct. 30, 1998, Appl. No. 582,689

Int. Cl. F04D *29/54;* **F03B** *3/16*

U.S. Cl. 415—204 **6 Claims**



1. A centrifugal pump formed by pressing and welding, consisting of an entrance flange, a discharge flange, a rear cover, a pump casing, and an impeller, characterized in that in the pump casing there is an integrated spiral chamber of approximately 360° pressed between the pump casing and the impeller, the chamber gradually increasing radially outward in the flowing direction of the fluid, its cross section being roughly a semicircle, there also being a discharge aperture roughly shaped as an ellipse, the discharge aperture neck being connected to the discharge aperture of the pump casing, the discharge aperture neck of the pump casing is welded on the discharge aperture of the pump casing with a diametrically-variable ellipse shape, the axial outer surface at the joint of the pump casing and the entrance flange is a camber with a gradually varying curvature, the curvature of the axial outer surface of the pump casing varies in connection with the radially extending height, the larger the radial extension, the smaller the axial curvature, in the pump casing there is labyrinth ring supports, which connect and support the inner side and outer side of the place where both the ribs of the entrance flange and the labyrinth ring supports sustain the pump casing.

US 6,409,475 B1

COMPUTER COOLING FAN

Chan Hsiang Ho, P.O. Box 24-108, Taipei, Taiwan

Filed Apr. 4, 2001, Appl. No. 824,913

Int. Cl. F04D *29/64*

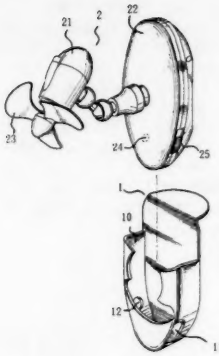
U.S. Cl. 416—63 **2 Claims**

1. A computer cooling fan comprising:

a fan, said fan comprising a stand, a fan blade, a fan head unit supported on said stand and controlled to rotate said fan blade, and power supply means mounted in said stand and controlled to provide electricity to said fan head unit; and

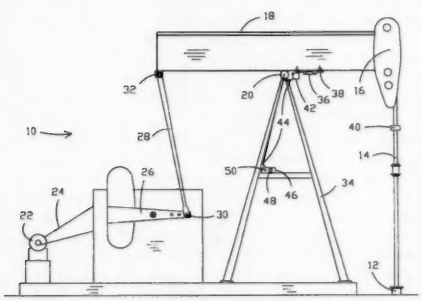
a fan holder injection-molded from plastics and fixedly fastened to an object for supporting said fan on said object;

wherein said fan comprises a ball socket joint coupled between said fan stand and said fan head unit for enabling said fan blade to be turned with said fan head unit relative to said fan



stand to the desired angle; said fan holder comprises a receptacle adapted to hold the fan stand of said fan.

US 6,409,476 B2
PUMPJACK DYNAMOMETER AND METHOD
Manuel D. Mills, Midland, Tex., assignor to DJAX Corporation, Midland, Tex.
Continuation-in-part of application No. 09/369,792, filed on Aug. 6, 1999, now Pat. No. 6,176,682. This application Dec. 22, 2000, Appl. No. 747,831.
This patent is subject to a terminal disclaimer.
Int. Cl. F04B *49/00*
U.S. Cl. 417—18 **23 Claims**



1. A dynamometer readout apparatus for a pumpjack with a walking beam, said walking beam being pivotally moveable in a first pivotal direction and in an opposite second pivotal direction, said walking beam changing pivotal direction twice during each pumping cycle for pumping a well, said apparatus comprising:

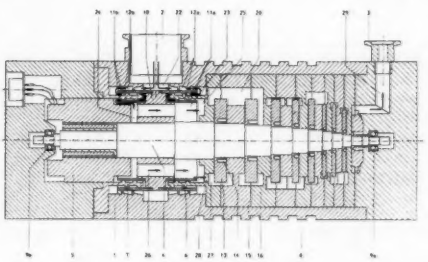
an encoder component pivotally secured to said walking beam, said encoder component having a plurality of spaced apart slots disposed therein, said encoder being biased to remain at a reference orientation relative to said walking beam;

first and second light emitters with corresponding first and second light detectors respectively aligned on opposing sides of said encoder component, said first and second light emitters and corresponding first and second light detectors being fixed to said walking beam for angular movement in said first and second pivotal directions with respect to said reference orientation of said encoder component, said first and second light emitters and corresponding first and second light detectors being mounted with a spacing different than said spaced apart slots of said encoder component to thereby produce a first sequence of signals for movement of said walking beam in said first pivotal direction and a second sequence of signals for movement of said walking beam in said second pivotal direction;

a load sensor mounted to detect loading corresponding to said pumping cycle for producing an electrical load signal; and

a processor electrically connected to said first and second light detectors to receive said first sequence of signals and said second sequence of signals, said processor analyzing said first sequence of signals and said second sequence of signals to detect a change in direction from said first pivotal direction of said walking beam to said second pivotal direction of said walking beam, said processor using said change in direction to control initiation of sampling of said electrical load signal.

US 6,409,477 B1
VACUUM PUMP
Armin Blecker, Asslar; Wolfgang Eberl, Solms; Heinrich Lotz, Wetzlar, and Heinz Reichhart, Asslar-Berghausen, all of Germany, assignors to Pfeiffer Vacuum GmbH, Asslar, Germany
Filed Jul. 5, 2000, Appl. No. 609,978
Claims priority, application Germany, Jul. 5, 1999, 199 30 952
Int. Cl. F04B *23/08;23/14;17/00;3/00*
U.S. Cl. 417—199.1 **6 Claims**

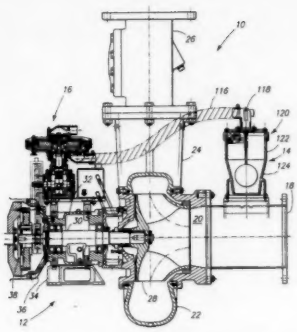


1. A vacuum pump, comprising a suction region; a discharge region; two gas friction pumps arranged on opposite side of the suction region and parallel to each other in a gas flow direction from the suction region to the discharge region, each of the gas friction pumps having at least one stage and a discharge region; channel means connecting the discharge regions of the two gas friction pumps and providing for gas flow from the discharge regions of the two gas friction pumps into a common discharge region of the two gas friction pumps; a multi-stage pump located downstream of both friction pumps for compressing the gas flowing through the multi-stage pump and having a suction region and a discharge region connected with the discharge region of the vacuum pump; and conduit means for connecting the common discharge region of the gas friction pumps with the suction region of the downstream multi-stage pump.

US 6,409,478 B1
VACUUM-ASSISTED PUMP
William B. Carnes, Milwaukie; Milton K. Leonard, Lake Oswego, both of Oreg., and Robert B. Ray, Vancouver, Wash., assignors to Roper Holdings, Inc., Wilmington, Del.
Filed Feb. 26, 1999, Appl. No. 258,833
Int. Cl. F04D *9/04*
U.S. Cl. 417—200 **23 Claims**

1. A self-priming pump, comprising:

a centrifugal pump section including a volute and an impeller disposed in the volute and supported on an impeller shaft, the impeller shaft being supported in a bearing housing and having a drive end opposite the impeller, the pump section



further including a bracket attached to the bearing housing and surrounding the drive end of the impeller shaft;

a motor mounted to the bracket and configured to turn the impeller shaft;

a vacuum pump assembly mounted to the centrifugal pump section and having a vacuum pump input shaft configured to actuate a diaphragm-type vacuum pump upon rotation; and

a drive linkage extending from the drive end of the impeller shaft through the bracket and to the vacuum pump input shaft, the drive linkage being configured to transfer power from the drive end of the impeller shaft to the vacuum pump assembly when the motor turns the shaft.

US 6,409,479 B1

VARIABLE DISPLACEMENT PISTON PUMP/MOTOR

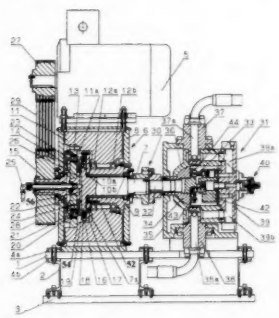
Takao Ito, and Hisanobu Kanamaru, both of Sagamihara, Japan, assignors to Aida Engineering Co., Ltd., Japan

Filed Nov. 2, 2000, Appl. No. 704,447

Claims priority, application Japan, Jan. 11, 2000, 2000-002157

Int. Cl. F04B *9/00;* **F01B** *3/00*

U.S. Cl. 417—319 **1 Claim**



1. In a variable displacement piston pump/motor wherein rotation energy accumulated in a flywheel is transferred via a clutch device to a pump device to provide rotation and generate oil pressure,

a variable displacement piston pump/motor comprising:

an electric motor;

a cylindrical boss supporting a drive shaft of a pump, said pump drive shaft being rotated by said electric motor and fixed on fixed frames serving as side walls;

a hollow flywheel rotatably supported on an outer perimeter of said cylindrical boss, disposed overlappingly concentrically with said cylindrical boss and said pump drive shaft, said flywheel rotating integrally with an input shaft rotated by the output from said electric motor;

a multi-plate clutch interposed between an inner perimeter end surface of said flywheel and an inner perimeter end surface of pump drive shaft;

a multi-plate brake device disposed parallel to said multi-plate clutch device and interposed between an outer perimeter of said pump drive shaft and a fixed support plate formed integrally with said cylindrical boss;

a driven shaft connected with a coupling to said pump drive shaft; and

an oil suction path and an oil discharge path disposed radially of said driven shaft; and a pump device including a variable displacement operating mechanism.

US 6,409,480 B1

DRIVE UNIT FOR HYDRAULIC CONSUMERS FOR INDIVIDUAL STRUCTURAL COMPONENT PARTS OF A MACHINE

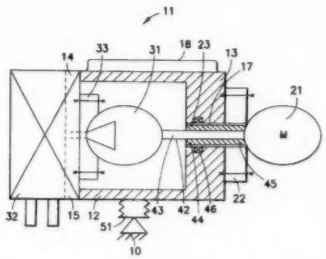
Kurt Dieno, Rosstal; Andreas Kübel, Lauf; Hans-Jürgen Popp, Gräfenberg, and Ernst Würl, Höttingen, all of Germany, assignors to Mannesmann AG, Düsseldorf, Germany

Filed May 15, 2000, Appl. No. 570,981

Claims priority, application Germany, May 14, 1999, 199 22 947

Int. Cl. F01B *23/08*

U.S. Cl. 417—321 **13 Claims**



1. A drive unit for hydraulic consumers for individual structural component parts of a machine for producing shaped articles from molding materials, comprising:

a motor;

a pump driven by the motor; and

a carrying part configured to connect at least one of the pump and the motor to the machine, the carrying part having an enclosed pipe-shaped area which is closed at both ends by at least one of a bottom and a cover, at least the pump projecting into the carrying part and being enclosed and surrounded by the carrying part, the pump being attached to the carrying part on a side facing away from the motor, a portion of the carrying part being constructed as a connection block.

US 6,409,481 B1

HERMETICALLY ENCAPSULATED COMPRESSOR

Walter Brabek, Jennersdorf, and Josef Hirtzi, Bad Waltersdorf, both of Austria, assignors to Verdichter Oe. Ges,m.b.H., Fürstenfeld, Austria

PCT No. PCT/AT99/00020, § 371 Date Jul. 12, 2000, § 102(e) Date Jul. 12, 2000, PCT Pub. No. WO99/39425, PCT Pub. Date Aug. 5, 1999

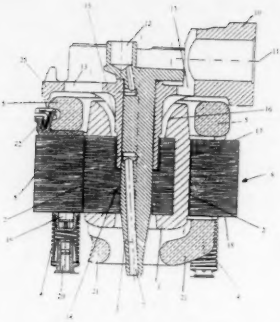
PCT Filed Jan. 27, 1999, Appl. No. 601,065

Claims priority, application Austria, Jan. 28, 1998, 134/98

Int. Cl. F04B *17/00;35/00*

U.S. Cl. 417—363 **5 Claims**

5. A method for assembling a compressor hermetically encapsulated in a compressor housing for use in small-size refrigerating installations, which compressor comprises a cylinder housing



including an extension, a crankshaft held in the extension and having an axis extending perpendicularly to an axis of the cylinder housing, an electromotor including a rotor and a stator having a central bore and surrounding the rotor, the rotor and the stator defining an annular air gap therebetween, the crankshaft projecting from the cylinder housing extension through an end face of the electromotor facing the cylinder housing extension and into a central bore in the rotor, and the crankshaft being affixed to the rotor, which comprises the steps of

(a) introducing the crankshaft into a bearing in the cylinder housing extension and affixing the crankshaft to the rotor,

(b) holding the stator in a fixed position and introducing the crankshaft to which the rotor is affixed through the end face into the central bore of the stator,

(c) displacing the rotor in a first direction in a plane perpendicular to the crankshaft axis along a straight line until the rotor touches the interior wall of the central stator bore,

(d) displacing the rotor in a second direction opposite to the first direction and measuring the path of displacement until the rotor touches in the interior wall of the central stator bore,

(e) positioning a center point of the rotor in a center of the measured chord of the central stator bore,

(f) displacing the rotor in a third direction normal to the direction of the measured chord until the toror touches the interior wall of the central stator bore,

(g) displacing the rotor in a fourth direction opposite to the third direction and measuring the path of displacement until the rotor touches in the interior wall of the central stator bore,

(h) positioning a center point of the rotor in a center of the measured chord of the central stator bore, and

(i) fixing the stator to the cylinder housing including the extension.

US 6,409,482 B1

DOUBLE-FORCE TYPE PRESSURE CYLINDER STRUCTURE

Wang Wing Fon, No. 135, Nan-Shih, Nan-Shih Li, Yuan-Li Chen, Miao-Li Hsien, Taiwan

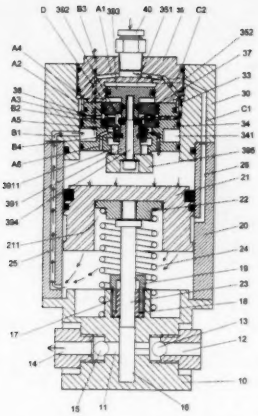
Filed Sep. 13, 2000, Appl. No. 661,149

Int. Cl. F04B *17/00*

U.S. Cl. 417—399 **9 Claims**

1. A double-force type pressure cylinder-structure comprising:

a pressurizing cylinder base (**10**) defining a radial through hole (**11**) having a first side threadedly provided with a liquid inlet port (**12**) having a distal end for receiving a first ball (**13**), thereby forming a first check valve, and having a second side threadedly provided with a liquid outlet port (**14**) having a distal end for receiving a second ball (**15**), thereby forming a second check valve, said pressure cylinder base (**10**) having a central portion defining a pressurizing cylinder chamber (**16**) for receiving a piston rod (**23**), said pressurizing cylinder chamber (**16**) having a top defining a screw hole (**17**) for receiving a sealing bushing (**18**), a support bushing (**19**) screwed into said screw hole (**17**) for securing said sealing



bushing (**18**) and for supporting said piston rod (**23**) which is sealed by said sealing bushing (**18**);

a gas cylinder (**20**) secured on said pressurizing cylinder base (**10**) and containing a piston (**21**) therein, said piston (**21**) having a bottom defining an inner annular hole (**211**) for receiving a flange disk (**22**), said flange disk (**22**) having a central portion screwed on one end of said piston rod (**23**), a spring (**24**) having a first end secured on said flange disk (**22**) and a second end secured on an end face of said pressurizing cylinder base (**10**) so that said piston (**21**) is pushed upward by said spring (**24**), a main air drain hole (**25**) longitudinally defined in a wall of said gas cylinder (**20**) and extending into a bottom of said gas cylinder (**20**), a direction change air drain hole (**26**) longitudinally defined in said wall of said gas cylinder (**20**) and extending into a mediate portion of said gas cylinder (**20**); and

a top cap (**30**) secured on said gas cylinder (**20**) by bolts (**31**) and having a central portion defining a through stepped hole (**32**), said stepped hole (**32**) provided with an inner flange (**33**), said inner flange (**33**) having a bottom for receiving a lower piston base (**34**) and a top for receiving an upper piston base (**35**) which is screwed by bolts (**36**), said upper piston base (**35**) defining an inner cylinder chamber (**351**), said lower piston base (**34**) having an upper portion defining a concave annular hole (**343**) for receiving an upper valve plug (**37**) and a lower valve plug (**38**), and having a lower portion for receiving a spline (**391**) which defines a plurality of radially arranged slots (**3911**), an O-ring (**392**) mounted on a distal end of said spline (**391**), a direction change piston (**393**) slidably mounted in said inner cylinder chamber (**351**) of said upper piston base (**35**) and having an axle extending into said upper valve plug (**37**) and abutting an end face of said spline (**391**), a threaded post (**394**) extending through a block ring (**395**), through said spline (**391**) and screwed into said axle of said direction change piston (**393**) so that said spline (**391**) is integrally coupled with said direction change piston (**393**) while said block ring (**395**) closes said slots (**3911**) of said spline (**391**).

US 6,409,483 B2

VARIABLE-CAPACITY TURBINE

Yasuaki Jinnai, Kanagawa-ken, Japan, assignor to Mitsubishi Heavy Industries, Ltd., Tokyo, Japan

Filed Jan. 24, 2001, Appl. No. 767,735

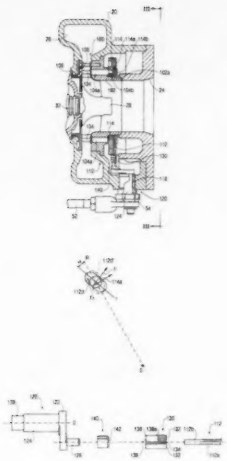
Claims priority, application Japan, Jan. 24, 2000, 2000-013598

Int. Cl. F02B *17/00*

U.S. Cl. 417—407 **3 Claims**

1. A variable-capacity turbocharger comprising:

a housing;



a turbine shaft;

a turbine provided in said housing, said turbine being freely rotatable on said turbine shaft;

a plurality of nozzle shafts;

a plurality of nozzle vanes arranged in nozzle units around said turbine in said housing, said plurality of nozzle vanes being free to rotate between opened and closed positions on said plurality of nozzle shafts, respectively;

a plurality of levers corresponding to said plurality of nozzle shafts, said plurality of levers being respectively connected to said plurality of nozzle shafts such that said plurality of levers and said plurality of nozzle shafts rotate together, wherein an end of each of said plurality of levers has a boss provided as a shaft, said plurality of shafts being parallel to said plurality of nozzle shafts;

a link plate having a plurality of oblong holes and being freely rotatable around said turbine provided in said housing, said link plate being connected to said plurality of nozzle vanes via said plurality of levers, and said link plate being operable to move said plurality of nozzle vanes between the opened and closed positions, wherein each of said plurality of bosses provided at said end of each of said plurality of levers is engaged in one of the plurality of oblong holes provided in said link plate, such that said plurality of bosses are free to swing in the plurality of oblong holes, respectively, and said plurality of bosses are connected to said link plate; and

an actuator connected to said link plate through a transmission mechanism,

wherein each of the plurality of oblong holes is curved along an arc tangent to a line extending at a given angle with respect to a radius of said link plate, such that when said link plate rotates, a component of a pushing force of each of said plurality of shafts is in a radial direction.

US 6,409,484 B1

OIL SUPPLY UNIT OF LINEAR COMPRESSOR

Seong Yeol Hyun, Changwon, Rep. of Korea, assignor to LG Electronics Inc., Rep. of Korea

PCT No. PCT/KR99/00821, § 371 Date Aug. 24, 2000, § 102(e) Date Aug. 24, 2000, PCT Pub. No. WO00/39461, PCT Pub. Date Jul. 6, 2000

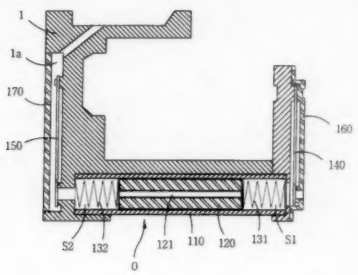
PCT Filed Dec. 27, 1999, Appl. No. 623,009

Claims priority, application Rep. of Korea, Dec. 28, 1998, 99-59383

Int. Cl. F04B *17/04*

U.S. Cl. 417—417 **10 Claims**

1. An oil supply unit of a linear compressor comprising:



a well-closed container filled with oil; a frame installed within the well-closed container;

a cylinder fixed at the frame;

a piston inserted in the cylinder and being linearly and reciprocally movable by a linear motor;

an oil cylinder fixed at a lower portion of the frame so as to be put in the oil filling the well-closed container, and being vibrated in the horizontal direction according to the reciprocal movement of the piston;

an oil piston inserted in the oil cylinder in a manner of dividing the inside of the oil cylinder to a suction space and a discharge space that communicate with each other, and being vibrated in the horizontal direction;

an oil suction unit installed at an outer side of the suction side of the oil cylinder;

an oil discharge valve installed at the outer side of the discharging side of the oil cylinder;

wherein the oil suction valve is rectangular in form, of which an upper end portion is fixed at the frame and a lower end portion is rotatably positioned in the suction side direction of the oil cylinder; and

wherein the oil suction unit includes an oil suction valve for opening and closing the suction side of the oil cylinder, and an oil suction cover for covering the suction side of the oil cylinder and having the oil suction valve inside thereof.

US 6,409,485 B1

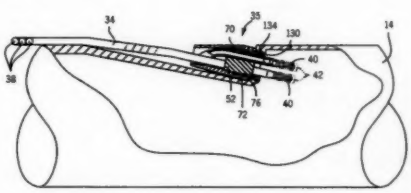
SYSTEM AND METHOD FOR SEALING AN ELECTRICAL CONNECTION BETWEEN A POWER CABLE AND A SUBMERSIBLE DEVICE

Paul D. K. Ebner, Shawnee, Kans., assignor to Camco International, Inc., Houston, Tex.

Filed Jun. 6, 2000, Appl. No. 587,808

Int. Cl. F04B *17/00;* **H01R** *13/40;13/58;* **H02K** *5/10*

U.S. Cl. 417—423.1 **26 Claims**



1. A pothead sealing system, comprising:

a housing having an interior passage;

a plurality of conductors extending through the interior passage;

a single block disposed in the interior passage, the single block including a plurality of passages for receiving the plurality of conductors therethrough;

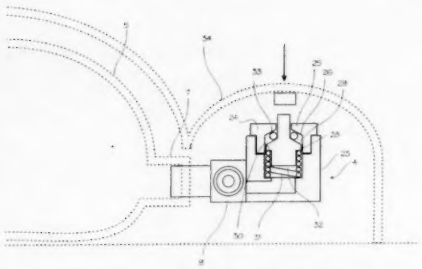
a retainer positioned to secure the single block at a desired position in the housing; and

a seal disposed between the interior passage and the single block.

US 6,409,486 B1
SHOE WITH INFLATABLE BLADDER AND SECURE DEFLATION VALVE

Jai K. Baek, San Diego, Calif., assignor to DC Shoes, Inc., Vista, Calif.

Filed Sep. 12, 2000, Appl. No. 660,265
Int. Cl. F04B *41/00;* **A43B** *13/20*
U.S. Cl. 417—440 **2 Claims**



1. A pump and deflation valve assembly for use with a fluid bladder, said assembly comprising:

a bladder pump having an inlet port and an outlet port, said outlet port aligned to discharge fluid into the bladder;

a deflation valve having an input port in fluid communication with the bladder and an output port;

said deflation valve comprising:

valve body comprised on a non-conformable material, said valve body having a bore extending therethrough, from the inlet port to the outlet port;

an upper inwardly extending flange, said flange characterized by a bottom surface, a top surface, and a bore extending from the bottom surface to the top surface, said bottom surface serving as a valve seat;

a plunger extending through the bore, said plunger having a upper segment of small diameter making it capable of moving through the bore of the upper inwardly extending flange, said plunger having a lower segment of larger diameter such that said lower segment cannot pass through the bore of the upper inwardly extending flange, said lower segment of the plunger having a upper surface positioned in apposition to the bottom surface of the upper inwardly extending flange and a lower surface;

a ring comprising a conformable material disposed between the plunger lower segment and the upper inwardly extending flange.

US 6,409,487 B1
SHOE WITH INFLATABLE BLADDER AND SECURE DEFLATION VALVE

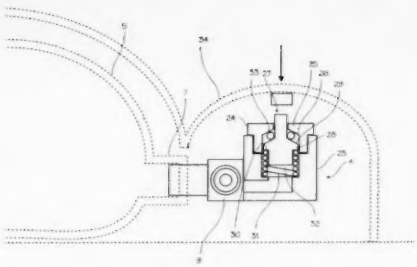
Jai K. Baek, San Diego, Calif., assignor to DC Shoes, Inc., Vista, Calif.

Continuation-in-part of application No. 09/660,265, filed on Sep. 12, 2000. This application Dec. 15, 2000, Appl. No. 738,947.
Int. Cl. F04B *41/00;* **A43B** *13/20*
U.S. Cl. 417—440 **4 Claims**

1. A pump and deflation valve assembly for use with a fluid bladder, said assembly comprising:

a bladder pump having an inlet port and an outlet port, said outlet port aligned to discharge fluid into the bladder;

a deflation valve having an input port in fluid communication with the bladder and an output port;



said deflation valve comprising:

a valve body comprised of a non-conformable material, said valve body having a bore extending therethrough, from the inlet port to the outlet port; an inwardly extending flange, said flange characterized by a bottom surface, a top surface, and a bore extending from the bottom surface to the top surface, said bottom surface serving as a valve seat;

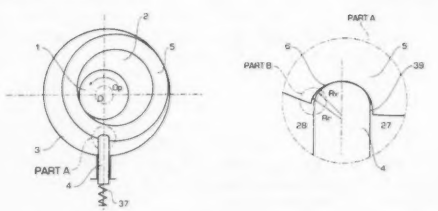
a plunger extending through the bore, said plunger having an upper segment of small diameter making it capable of moving through the bore of the upper inwardly extending flange, said upper segment having an annular groove thereon, said plunger having a lower segment of larger diameter such that said lower segment cannot pass through the bore of the upper inwardly extending flange, said lower segment of the plunger having an upper surface positioned in apposition to the bottom surface of the upper inwardly extending flange and a lower surface; and

a ring comprising a conformable material disposed between the plunger lower segment and the upper inwardly extending flange, said ring having an inner diameter slightly smaller than the diameter of the upper segment.

US 6,409,488 B1
ROTARY COMPRESSOR

Mitsuhiro Ikoma; Terumaru Harada, both of Ikoma; Fumitoshi Nishiwaki, Nishinomiya; Hidenobu Shintaku, Neyagawa; Hiroshi Hasegawa, Katano, and Etsuro Suzuki, Fujisawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., and Matsushita Refrigeration Company, both of Osaka, Japan

Division of application No. 08/891,155, filed on Jul. 10, 1997, now Pat. No. 6,132,195. This application Sep. 18, 2000, Appl. No. 664,311.
Claims priority, application Japan, Jul. 10, 1996, 8-180269; Sep. 18, 1996, 8-245856; Nov. 19, 1996, 8-307588
Int. Cl. F04C *18/44*
U.S. Cl. 418—67 **5 Claims**



1. A rotary compressor comprising:

a cylinder,

a crank shaft having an eccentric part disposed in said cylinder,

a bearing which rotatably supports said crank shaft,

a roller which moves in said cylinder following said eccentric part, and

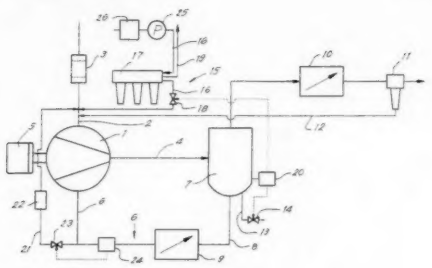
a vane having a tip which is circular in cross section with a radius R_v,

wherein a groove is provided on a part of the outer periphery of said roller, with the tip of said vane being disposed in contact swingably in said groove, and a wedge shaped gap formed in a predetermined relation between said tip of the vane and said groove in the sliding direction thereof.

US 6,409,489 B1
COMPRESSOR INSTALLATION WITH WATER-INJECTED COMPRESSOR ELEMENT

Willy Joseph Rosa Bodart, Antwerp, and Bart Anton Lode Talboom, Kontich, both of Belgium, assignors to Atlas Copco Airpower, naamloze vennootschap, Wilrijk, Belgium

Filed Jun. 27, 2001, Appl. No. 891,297
Claims priority, application Belgium, Jun. 27, 2000, 000409
Int. Cl. F04C *29/02*
U.S. Cl. 418—84 **9 Claims**



1. A compressor installation with

at least one water-injected volumetric compressor element, provided with a suction line and a compressed air line;

driving means for this compressor element;

a water cycle in which the compressor element is erected, containing a water separator erected in the compressed air line and a return line for the separated water, extending between the bottom side of said water separator and the inner space of the compressor element;

a water supply device for supplying water to the water cycle containing a water supply line with a controllable valve therein and a reverse osmosis filter;

a device for measuring the amount of water in said water cycle;

a device for measuring the conductivity of the water in this water cycle,

a by-pass connected to the water cycle in which are erected an ion exchanger and a controllable valve;

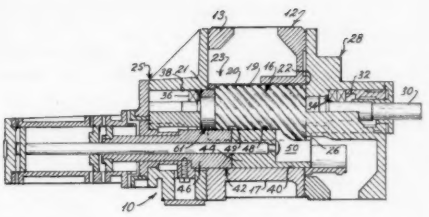
whereby the valve in the water supply line is controlled by the device for measuring the amount of water in the water cycle, and the valve in the by-pass is controlled by the device for measuring the conductivity of the water.

US 6,409,490 B1
ROTARY SCREW COMPRESSOR WITH SLIDE VALVE AND SLIDE STOP GUIDANCE BUSHINGS

Paul Nemit, Jr., Roanoke, Va., and Charles M. Beall, Jr., Hagerstown, Md., assignors to York International Corporation, York, Pa.

Filed May 25, 2001, Appl. No. 864,234
Int. Cl. F04C *18/16;29/08*
U.S. Cl. 418—201.2 **21 Claims**

1. In a rotary screw compressor having a housing including generally parallel rotor bores which extend from a fluid inlet to a discharge outlet and wherein a pair of rotors having intermeshing lands and grooves are mounted by oppositely oriented rotor shafts which are rotatably supported in bearings provided in bearing bores adjacent the fluid inlet and discharge outlet, and wherein the compressor capacity is controlled utilizing a slide valve assembly

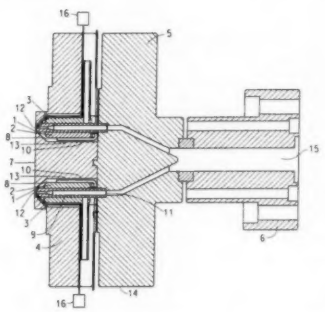


including a slide valve which is moveable in a secondary bore which extends generally parallel to the rotor bores, the slide valve assembly having upper surface portions of a first configuration which surface portions oppose the rotors and wherein means are provided to slidably adjust the position of the slide valve, the improvement comprising; at least two first guide bushings each having an inner annular sleeve and an outer flange, each of said inner sleeves being cooperatively seated in one of the bearing bores adjacent the fluid inlet so as to be in surrounding relationship with the rotor shafts such that said outer flanges extend within the rotor bores, each of said outer flanges having a guide surface of a shape complementary to said first configuration of and engaging the upper surface portions of the slide valve assembly to thereby provide guidance for the slide valve relative to the rotors.

US 6,409,491 B1
EXTRUSION DIE ASSEMBLY

Kenneth Wayne Leffew, Kennett Square, Pa., and David Peter Rule, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of application No. 09/295,971, filed on Apr. 21, 1999, now abandoned, Provisional application No. 60/082,720, filed on Apr. 23, 1998. This application Feb. 2, 2001, Appl. No. 775,452.
Int. Cl. B29B *9/06;* **B29C** *47/86*
U.S. Cl. 425—67 **6 Claims**



1. An extrusion die assembly for extruding polymer melts comprising:

(a) a plurality of extrusion barrels, each barrel comprising an inlet end, an outlet end, and an interior cavity, the interior cavity containing polymer melt which is conveyed from the inlet end to the outlet end;

(b) a plurality of heaters, each heater having a hollow, cylindrical shaped interior, and each heater containing a corresponding extrusion barrel within the interior, such that the corresponding extrusion barrel is heated to a predetermined temperature;

(c) a die plate, having an outer die face, and a plurality of die plate cavities, each of the die plate cavities forming a housing for supporting one of the plurality of extrusion barrels and heaters, each extrusion barrel and corresponding heater disposed within a corresponding die plate cavity, and each of the

die plate cavities having an air gap between the heater and a die plate cavity inner surface;

(d) a plurality of devices for the direct or indirect measurement of polymer melt flow, each flow measuring device disposed in a corresponding extrusion barrel outlet in contact with the polymer melt at a location immediately interior of the extrusion barrel outlet; and

(e) at least one controller taking signals from said flow measuring devices and directing one or more of the plurality of heaters to supply heat as needed to the extrusion barrel outlets to maintain preselected temperatures.

US 6,409,492 B1

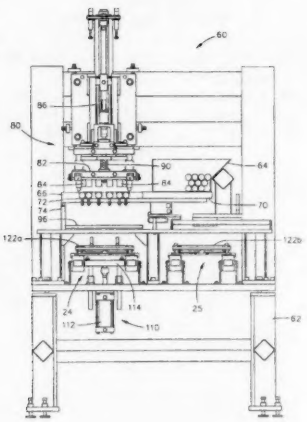
CAST MOLDING INSERTION APPARATUS

Gary G. Marshall, Soddy Daisy, Tenn., assignor to Callaway Golf Company, Carlsbad, Calif.

Division of application No. 09/495,588, filed on Feb. 1, 2000. This application Nov. 2, 2001, Appl. No. 682,955.

Int. Cl. B29C *70/70;39/10*

U.S. Cl. 425—116 **11 Claims**



1. A system for casting a thermoset layer on a golf ball precursor product, the system comprising:

a first mold half having a plurality of cavities therein;

a source of golf ball precursor products;

a platen for receiving a plurality of golf ball precursor products in a predetermined pattern;

a locating plate having a plurality of vacuum cups for suctioning a corresponding golf ball precursor product from the platen, the locating plate movable along a longitudinal pathway from at least a platen position, an upper limit position and an insertion position;

a spacer plate disposed along the longitudinal pathway and having an aperture for placement of each of the vacuuming cups, with a golf ball precursor product, therethrough; and

a lifter for lifting the first mold half along the longitudinal pathway to the spacer plate for receiving of each of the plurality of golf ball precursor products in a corresponding cavity of the plurality of cavities.

US 6,409,493 B1

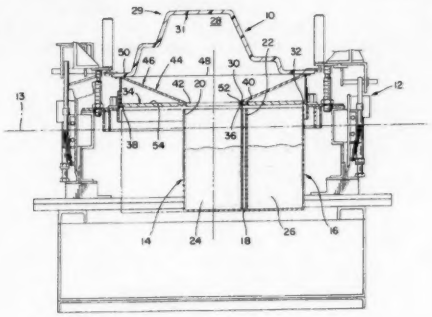
DOUBLE-CAST SLUSH MOLDING METHOD AND APPARATUS

John MacDonald, Dover; Michael Conroy, Barrington, both of N.H.; MaryLou Smith LeCoz, and Marvin Nelson, both of Canada, Canada, assignors to Textron Automotive Company, Inc., Troy, Mich.

Filed Mar. 20, 2000, Appl. No. 528,396

Int. Cl. B29C *41/04;41/22*

U.S. Cl. 425—130 **14 Claims**



1. An apparatus for molding a thin shell having an outer layer and an inner layer, the apparatus comprising:

at least two tubs configured to hold charge materials for delivery to a mold cavity, each tub having a tub opening for dispensing charge materials;

the tubs being simultaneously rotatable around a horizontal axis to an orientation where the charge materials will dispense from the tubs;

the tub openings configured to be alternately blockable to allow the tubs to alternately dispense charge material into the mold cavity.

US 6,409,494 B1

DEVICE FOR THE EXTRUSION OF MULTI-LAYER PLASTIC FILMS, BOARDS OR TUBES

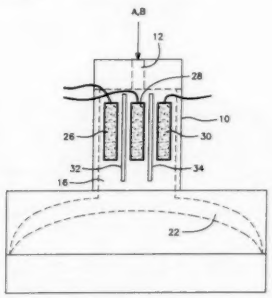
Klaus-Peter Voss, deceased, late of Lengerich, Germany, by Jana Vanessa Voss, legal representative, assignor to Windmöller & Hölscher, Lengerich.Westf., Germany

Filed May 25, 1999, Appl. No. 317,606

Claims priority, application Germany, May 25, 1998, 198 23 304

Int. Cl. B29C *47/006*

U.S. Cl. 425—133.5 **15 Claims**



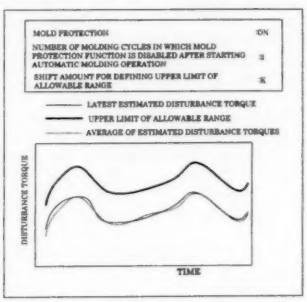
1. A device for extruding multilayer plastic films, boards or tubes with a feed block, having inputs that are fed with polymer melts and which conveys the polymer melts along a melt line from said inputs via individual layer channels to a slotted passage

forming an output, said feed block comprising a plurality of temperature control units spaced apart from one another along a width of, and adjacent to, each individual layer channel within the feed block to provide temperature differentials within each polymer melt layer, said width being transverse to a flow direction of said polymer melt layers, a longitudinal axis of said temperature control units being substantially parallel to said flow direction.

US 6,409,495 B1
MOLD PROTECTION DEVICE FOR INJECTION MOLDING MACHINE

Masao Kamiguchi; Tatsuhiro Uchiyama, and Masayuki Ueno, all of Yamanashi, Japan, assignors to Fanuc, Ltd., Yamanashi, Japan

Filed Jul. 18, 2000, Appl. No. 618,730
Claims priority, application Japan, Jul. 19, 1999, 11-204392
Int. Cl. B29C *45/66;45/76;45/84*
U.S. Cl. 425—150 **8 Claims**


MOLD PROTECTION
ON
NUMBER OF MOLDING CYCLES IN WHICH MOLD PROTECTION FUNCTION IS DISABLED AFTER STARTING AUTOMATIC MOLDING OPERATION
2
SHIFT AMOUNT FOR DEFINING UPPER LIMIT OF ALLOWABLE RANGE
K
LATEST ESTIMATED DISTURBANCE TORQUE
UPPER LIMIT OF ALLOWABLE RANGE
AVERAGE OF ESTIMATED DISTURBANCE TORQUES
DISTURBANCE TORQUE
TIME

1. A mold protection device for an injection molding machine having a mold claiming mechanism driven by a servomotor, comprising:

a disturbance estimating observer to estimate a disturbance torque exerted on the servomotor at least within a mold protection region in every mold closing process;

a controller to define an upper limit value of the disturbance torque based on an average value of disturbance torques estimated by said disturbance estimating observer in a plurality of mold closing processes, and to issue an abnormal signal when a disturbance torque estimated by said disturbance estimating observer in a present mold closing process exceeds the upper limit value in the mold protection region.

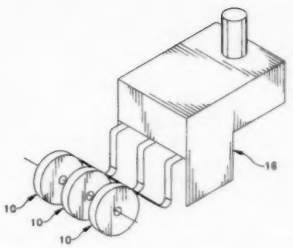
US 6,409,496 B1
THERMOFORMER MACHINE

W. Charles Jones, East Sandwich, Mass., assignor to Emerging Technologies Trust, Osterville, Mass.

Continuation of application No. 09/401,454, filed on Sep. 22, 1999, which is a continuation of application No. 09/071,440, filed on May 1, 1998, now Pat. No. 6,129,538, Provisional application No. 60/045,243, filed on May 1, 1997. This application Sep. 1, 2000, Appl. No. 654,000.
This patent is subject to a terminal disclaimer.
Int. Cl. B29C *51/02;51/42*
U.S. Cl. 425—302.1 **12 Claims**

1. A thermoformer machine for forming blisters with a flange, and which thermoformer machine comprises:

a) a supply station comprising at least one precut, zero-scrap roll of thermoplastic material, which roll comprises: a plurality of generally longitudinally-aligned connected webs, the webs connected by a cut area at each end of the web, the webs having a selected width (W) and a length (L) to define a blister area and a blister flange area to be subsequently formed, with a cut depth (D1) at each end of the web which is less than the width (W), and with the web having corners with a radius (R), the cut area adapted for transverse cutting to separate a formed blister, with flange, from each web;



b) a heating station to apply heat to the blister area of the web without heat deforming the flange area;

c) a forming station to form a blister from the heated blister area;

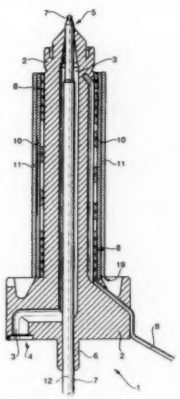
d) a cutting station to cut the cut areas of the web to form an individual blister with a flange; and

e) a material transport means to index the precut roll through the heating, forming, and cutting stations.

US 6,409,497 B1
HOT RUNNER NOZZLE

Walter Würstlin, Bahlingen, Germany, assignor to Otto Manner Heisskanalsysteme GmbH & Co. KG, Bahlingen, Germany

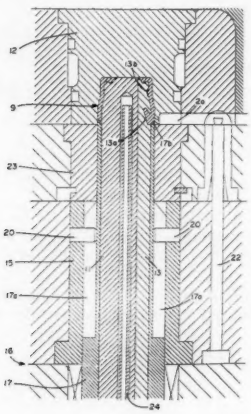
Filed Oct. 11, 2000, Appl. No. 686,379
Claims priority, application Germany, Oct. 18, 1999, 199 50 273
Int. Cl. B26C *45/20*
U.S. Cl. 425—549 **11 Claims**



1. A hot runner nozzle (**1**) for injection molding comprising a nozzle body (**2**) having a nozzle exit (**5**) for melts, at an exterior perimeter of which at least one jacket-heating unit (**8**) to heat the nozzle body (**2**) is located, wherein the heating unit (**8**) is enclosed at an exterior perimeter thereof by a sleeve (**10**), and wherein the sleeve (**10**) and the heating unit (**10**) are flexible in a radial direction, characterized in that the sleeve (**10**) is enclosed at its exterior perimeter by at least one circular lock (**11**) that rotates about a longitudinal axis (**12**) relative to the sleeve (**10**) between a released position and a clamped position, the facing surfaces of the sleeve (**10**) and the lock (**11**) each have a profile deviating from that of a cylindrical shell located concentric to the longitudinal axis (**12**), and at least one of the facing surfaces includes at least in

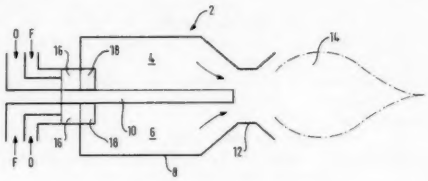
areas a wedge lock surface (**13**) that has an abutting slant against which a seating area (**14**) of the surface of the other part (**10**, **11**) lies.

US 6,409,498 B1
APPARATUS FOR MOLDING PLASTIC CAPS
David A. Manera, Vineland; Frank Maatje, Richwood; Arnold Zingler, Williamstown; Dan Lakutis, Elmer; Richard A. Lappine, Millville, and Don Horner, Monroeville, all of N.J., assignors to Comar, Inc., Buena, N.J.
Continuation of application No. 09/049,064, filed on Mar. 27, 1998, now Pat. No. 6,079,973. This application Apr. 18, 2000, Appl. No. 551,048.
This patent is subject to a terminal disclaimer.
Int. Cl. B29C *45/44*
U.S. Cl. 425—556 **8 Claims**



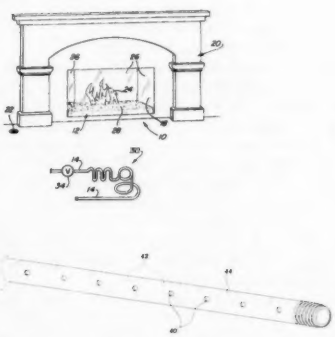
1. Apparatus for molding a plastic cap having a top wall and a depending skirt having a plurality of inwardly and upwardly extending tabs integral with the lower edge of the skirt and a plurality of radially inwardly extending ribs integral with the inner wall surface of the skirt, comprising a fixed platen assembly, a core secured to said fixed platen assembly, a movable platen assembly spaced from said fixed platen assembly, a female mold having a cup-shaped cavity mounted in said movable platen assembly, said cup-shaped cavity being connected to a supply of flowable plastic material, a movable plate assembly and a fixed plate assembly positioned between the fixed and movable platens, said core extending through the movable and fixed plate assemblies into the cup-shaped cavity of said female mold, a plurality of longitudinally extending blades slidably mounted on the outer surface of said core, a first end of each of said blades being secured to said movable plate assembly, a second end of each of said blades extending into the female mold, recesses provided in the second end of each of said blades, said recesses having configurations corresponding to the inclined tabs and radially inwardly extending ribs on the cap, said core and blades being spaced inwardly from the wall of said cavity to provide a gap for receiving the flow of plastic material therein to form the cap, a drive member secured to said fixed plate assembly, a rotatable driven member mounted on said movable plate assembly, said rotatable driven member being operatively connected to said drive member, said driven member having an end portion engaging the lower peripheral edge of the molded cap skirt in the female mold, means for moving the movable plate assembly relative to the fixed plate assembly, whereby the drive member on the fixed plate assembly causes the driven member on the movable plate assembly to rotate, to thereby rotate the molded cap relative to the second end of each of said blades for moving the cap tabs and ribs away from the blade recesses prior to stripping the finished cap from the apparatus.

US 6,409,499 B1
VARIABLE STOICHIOMETRIC COMBUSTION
Christian J. Feldermann, Sheffield, United Kingdom, assignor to The BOC Group plc, Windlesham, United Kingdom
Filed Aug. 24, 1999, Appl. No. 379,409
Claims priority, application United Kingdom, Aug. 25, 1998, 98 18529
Int. Cl. F23M *3/02*
U.S. Cl. 431—8 **16 Claims**



1. A method of combustion comprising the steps of:
a) mixing flows of a first fluid fuel and a first fluid oxidant each having a velocity to produce a first, substantially homogeneous, sub-stoichiometric stream close to, at or below the lower flammability limit at ambient pressure;
b) mixing flows of a second fluid fuel and a second fluid oxidant each having a velocity to produce a second, substantially homogeneous, super-stoichiometric stream close to, at or above the upper flammability limit at ambient pressure;
c) combusting said first and second streams separately and substantially simultaneously to produce first and second products of combustion, combustion of the second stream being sustained;
d) mixing the first and second products of combustion upstream of a nozzle means so as to produce a substantially homogeneous mixed stream, and
e) passing the mixed stream through the nozzle means and causing the mixed stream to combust downstream thereof, whereby the first and second fluid fuels are substantially combusted.

US 6,409,500 B2
GLASS FIRE AND METHOD OF MAKING
Mark T. Georgantas, 2141 Venitia, Tustin, Calif. 92782
Continuation-in-part of application No. 09/386,579, filed on Aug. 30, 1999, now abandoned. This application Apr. 23, 2001, Appl. No. 841,620.
Int. Cl. F24C *3/04;3/00*
U.S. Cl. 431—125 **17 Claims**



1. A gas fire formed in a fireplace, comprising:
the fireplace having an opening, a supporting surface and a plurality of rear walls;

at least one gas pipe having two rows of openings therein held in the fireplace above the supporting surface to burn gas in soot-free flames; and

a bed of broken glass pieces formed from broken, tempered glass that is baked three times, and subject to sudden surface cooling, held on the supporting surface in the fireplace and surrounding the at least one gas pipe to allow the soot-free flames to burn near and over top of the bed of broken glass pieces without changing the color or appearance of the bed of broken glass pieces.

US 6,409,501 B1

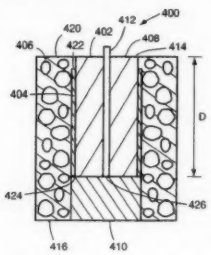
CANDLE WITH SURROUNDING DECORATIVE COMBUSTIBLE MATERIAL

George G. Pappas, Norwich, Ohio, assignor to Lumi-Lite Candle Company, Inc., Norwich, Ohio

Continuation-in-part of application No. 09/099,539, filed on Jun. 18, 1998, now Pat. No. 5,927,965. This application Jun. 7, 1999, Appl. No. 327,030.

Int. Cl. F23D *3/16*

U.S. Cl. 431—289 **19 Claims**



1. A candle, comprising:

(a) a fuel core including a wick which extends through the fuel core a selected distance from a top surface of the fuel core;

(b) a separating protective sleeve substantially extending and surrounding the fuel core at least the selected distance from the top surface of the fuel core; and

(c) a decorative, particulate combustible material exteriorly surrounding at least a portion of the sleeve, and separated from a molten pool of fuel, and interspersed in a candle fuel fill composition surrounding at least a portion of the sleeve and securing the combustible material to the sleeve.

US 6,409,502 B2

GAS BURNERS FOR HEATING A GAS FLOWING IN A DUCT

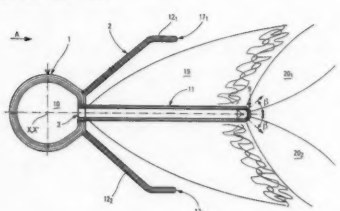
Frédéric Bury, Allauch, France, assignor to Entreprise Generale de Chauffage Industriel Pillard, France

Filed Feb. 2, 2001, Appl. No. 775,918

Claims priority, application France, Feb. 4, 2000, 00 01455

Int. Cl. F23D *14/46*

U.S. Cl. 431—350 **12 Claims**



1. A burner for placing in a duct to heat a gas flowing along said duct, the burner comprising a pipe on a first axis, said pipe extending transversely across a flow direction of said gas, the pipe being fed with fuel gas and being pierced by at least two holes in alignment on a common generator line, a flame stabilizer formed by two diverging deflector-forming fins with a first one of said fins being on a first side of said generator line and a second one of said fins being on a second side of said generator line, at least one of said holes being extended by a tube extending beyond outside edges of the fins, and said tube being pierced by at least one fuel gas ejection orifice at a distal end.

US 6,409,503 B1

HEAT TREATMENT METHOD AND HEAT TREATMENT APPARATUS

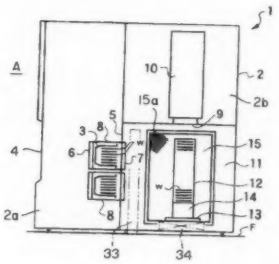
Seiichi Yoshida; Takashi Tanahashi; both of Sagamihara; Akira Onodera, Fuchu, and Motoki Akimoto, Sagamihara, all of Japan, assignors to Tokyo Electron Limited, Tokyo-To, Japan

Filed Jul. 20, 2000, Appl. No. 620,912

Claims priority, application Japan, Jul. 21, 1999, 11-205551; Apr. 19, 2000, 2000-117288

Int. Cl. F27D *3/00*

U.S. Cl. 432—239 **13 Claims**



1. A heat treatment apparatus comprising:

a loading area for storing workpieces transferred thereto from a clean room;

a heat treatment furnace connected to the loading area to process workpieces transferred from the loading area for performing a predetermined heat treatment process;

an exhaust for evacuating the loading area; and

a controller for controlling the exhaust so that the loading area is evacuated to have a predetermined negative pressure relative to the clean room.

US 6,409,504 B1

MANIPULATING A DIGITAL DENTITION MODEL TO FORM MODELS OF INDIVIDUAL DENTITION COMPONENTS

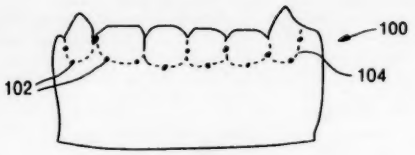
Timothy N. Jones, Mountain View; Muhammad Chishti, Menlo Park; Huafeng Wen, Redwood Shores, and Gregory P. Bala, San Jose, all of Calif., assignors to Align Technology, Inc., Santa Clara, Calif.

Continuation-in-part of application No. 09/264,547, filed on Mar. 8, 1999, which is a continuation-in-part of application No. 09/169,276, filed as application No. PCT/US98/12681, filed on Jun. 19, 1998, now abandoned, Provisional application No. 60/050,342, filed on Jun. 20, 1997. This application May 14, 1999, Appl. No. 311,941.

Int. Cl. A61C *3/00*

U.S. Cl. 433—24 **58 Claims**

1. A computer-implemented method for use in creating a digital model of an individual component from a digital model of a patient's dentition and adapted to generate one or more appliances used in treating the patient, the method comprising:



obtaining a 3D digital model of the patient's dentition;

identifying points in the digital model that lie on an interproximal margin between adjacent teeth in the patient's dentition;

using the identified points to create a digital cutting surface;

separating portions of the dentition model representing the adjacent teeth and;

generating one or more appliances used in treating the patient.

US 6,409,505 B1

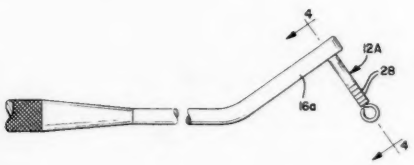
CENTRALLY ROTATING PERIODONTAL PROBE

Peter C. Kesling, 611 W. 250 South, LaPorte, Ind. 46350

Filed May 23, 2001, Appl. No. 863,723

Int. Cl. A61C *19/04*

U.S. Cl. 433—72 **19 Claims**



1. A rotating periodontal probe for measuring the depth of the gingival sulcus of a patient's tooth by insertion into and/or traversing the gingival sulcus, said probe comprising:

a handle,

a tubular shank extending from one end of the handle,

a centrally rotating shaft received in said tubular shank, and

a blunt end on said shaft outward of the free end of said shank for engaging the bottom of the sulcus, wherein said blunt end lies on the axis of rotation of said shaft.

US 6,409,506 B1

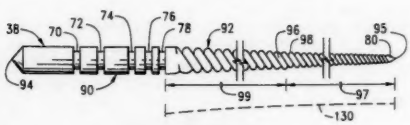
ENDODONTIC INSTRUMENTS AND PROCESS FOR PRODUCING THE SAME

Lonnie M. Graybill, York, Pa., assignor to Miltex Dental, Inc., Bethpage, N.Y.

Filed May 1, 2000, Appl. No. 563,048

Int. Cl. A61C *5/02*

U.S. Cl. 433—102 **23 Claims**



1. An endodontic instrument for use in performing root canal therapy on a tooth comprising:

an elongate shank having a proximate end, a pilot end and a uniform or non-uniform tapered peripheral surface adjacent the pilot end thereof;

a first plurality of continuous helical flutes which form cutting edges on said peripheral surface formed in and extending along a first portion of said peripheral surface; and

a second plurality of continuous helical flutes which form cutting edges on said peripheral surface formed in and extending along a second portion of said peripheral surface adjacent to said first portion thereof, said second plurality of helical flutes containing a number of flutes different from the number of flutes in said first plurality of helical flutes.

US 6,409,507 B1

DRIVE MECHANISM FOR OSCILLATORY DENTAL TOOL WITH IMPROVED BUSHING

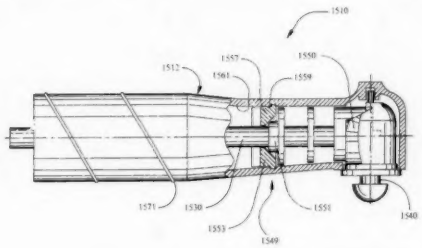
Robert T. Postal, Glen Cove, and Robert P. Wallace, Amawalk, both of N.Y., assignors to Twist2It, Inc., Woodside, N.Y.

Continuation-in-part of application No. 09/288,764, filed on Apr. 8, 1999, now Pat. No. 6,247,931, which is a continuation-in-part of application No. 08/878,995, filed on Jun. 19, 1997, now Pat. No. 5,931,672. This application Oct. 3, 2000, Appl. No. 678,802.

This patent is subject to a terminal disclaimer.

Int. Cl. A61C *3/03*

U.S. Cl. 433—118 **13 Claims**



1. A bearing assembly for a disposable prophy angle drive mechanism that includes a housing, a drive shaft and a driven shaft, said bearing assembly comprising:

a bushing, said bushing having an aperture dimensioned to receive said drive shaft of said drive mechanism, said bushing also having an inwardly facing frustoconical shaped surface; and

a journal located along said drive shaft, said journal having a contact surface sized and positioned to contact said frustoconical shaped surface of said bushing, said journal and said bushing positioned within said prophy angle drive mechanism to minimize axial movement of said drive shaft within said prophy angle drive mechanism.

US 6,409,508 B1

USE OF OZONE FOR THE TREATMENT OF DENTAL CARIES

Edward Lynch, London, United Kingdom, assignor to Natural White, Canada

PCT No. PCT/EP99/04035, § 371 Date Nov. 8, 2000, § 102(e) Date Nov. 8, 2000, PCT Pub. No. WO99/64020, PCT Pub. Date Dec. 16, 1999

PCT Filed Jun. 8, 1999, Appl. No. 700,275

Claims priority, application Ireland, Jun. 8, 1998, S980434

Int. Cl. A61C *5/04*

U.S. Cl. 433—226 **28 Claims**

1. A method of treating dental caries, the method comprising delivering ozone to the carious tissue at a pressure sufficient to kill substantially all of the micro-organisms within the carious tissue, without dissolving the carious tissue and without removal of the carious tissue following the ozone treatment.

US 6,409,509 B2

VR MOTION BASE CONTROL APPARATUS AND IT'S SUPPORTING STRUCTURE

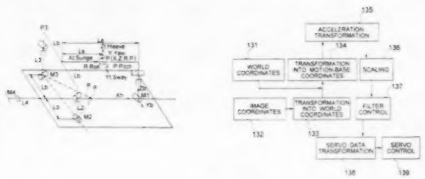
Tsukasa Shiina, Chiba; Minoru Katoh, Yachimata; Masayuki Oshiro, Inzai; Takayuki Kamiya, Chiba; Hiroshi Sakairi, Tsukuba; Masami Otomo, Funabashi, and Kenji Seino, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Keiyo Engineering Co., Ltd., Chiba-ken, both of Japan

Division of application No. 09/276,739, filed on Mar. 26, 1999. This application Jan. 26, 2001, Appl. No. 769,301.

Claims priority, application Japan, Mar. 30, 1998, 10-083092; Apr. 15, 1998, 10-104315; May 28, 1998, 10-147261

Int. Cl. G09B *9/00*

U.S. Cl. 434—55 **4 Claims**



1. A VR motion producing apparatus comprising:

a dynamic object to be controlled;

a motion base having a finite stroke;

motion model converting means for converting a motion model of the dynamic object to be controlled which is moved within a virtual reality space constituted by computer graphics into another motion model of the motion base having a finite stroke;

means for extracting coordinate data used to draw the motion model of the dynamic object to be controlled;

means for calculating a velocity change of the dynamic object to be controlled within the virtual reality space from the extracted coordinate data; and

means for calculating an attitude change of the dynamic object to be controlled every time instant.

US 6,409,510 B1

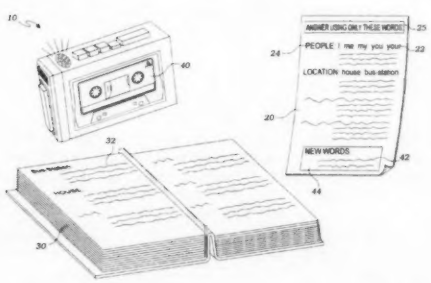
METHOD FOR LEARNING A FOREIGN LANGUAGE

William H. Firebaugh, 2213-A Via Mariposa E., Laguna Hills, Calif. 92653

Filed Mar. 13, 2001, Appl. No. 808,478

Int. Cl. G09B *19/06;19/08*

U.S. Cl. 434—157 **7 Claims**



1. A method for learning a foreign language, the method comprising the steps of:

a) providing a sheet imprinted with a select list of key words in the foreign language;

b) providing a definition of each of the key words;

c) providing a recording of a correct pronunciation of each of the key words;

d) memorizing the definition of each of the key words, as well as the correct pronunciation of each of the key words;

e) attempting to converse with a person fluent in the foreign language by:

providing the person with the sheet;

instructing the person to use only the key words in the conversation, and

without regard for sentence structure, grammar, or conjugation, conversing with the person in the foreign language based on the mutual understanding of the definition of and correct pronunciation of the key words; and

f) learning sentence structure, grammar, and conjugation through repeated conversations.

US 6,409,511 B2

SEQUENCE LEARNING TOY

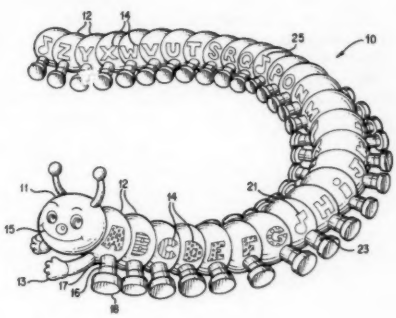
Mary Ann Cogliano, Loomis, Calif., assignor to LeapFrog Enterprises, Inc., Emeryville, Calif.

Continuation of application No. 09/592,581, filed on Jun. 12, 2000, now Pat. No. 6,247,934, which is a continuation of application No. 09/247,622, filed on Feb. 10, 1999, now Pat. No. 6,074,212, Provisional application No. 60/075,115, filed on Feb. 11, 1998. This application Jun. 18, 2001, Appl. No. 881,801.

This patent is subject to a terminal disclaimer.

Int. Cl. G09B *1/00*

U.S. Cl. 434—159 **41 Claims**



1. An educational toy, comprising:

a simulated animal figure provided with an elongated body provided with a plurality of segmented body parts extending in a substantially longitudinal direction from a front portion of said figure to an end portion of said figure;

a plurality of first switching devices connected to said plurality of segmented body parts, each of said plurality of first switching devices extending from said segmented body parts in the form of an appendage;

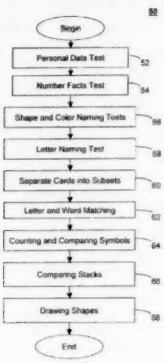
a series of indicia representative of a sequence of numbers, each of said indicium of said series of indicia associated with one of said plurality of first switching devices and further wherein each of said first switching devices is connected to said elongated body in the vicinity of its respective indicium, and further wherein said series of indicia is arranged on the educational toy in the sequence of numbers beginning from said front portion of said figure;

a microprocessor provided with a memory, said microprocessor included within said simulated figure and connected to each of said plurality of first switching devices;

a voice synthesizer provided with said simulated figure and connected to said microprocessor, said voice synthesizer producing a sound associated with said indicium when said switch associated with its respective indicium is engaged; and

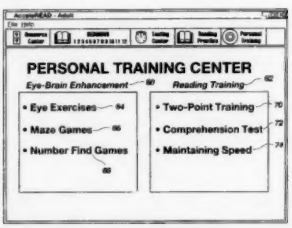
a speaker connected to said voice synthesizer.

US 6,409,512 B1
METHOD AND TESTING INSTRUMENT FOR ASSESSING SKILLS OF AN INDIVIDUAL
Loretta Catto, 3330 Cumberland Trail, Olympia Fields, Ill. 60461
Continuation of application No. 09/174,221, filed on Oct. 16, 1998, now Pat. No. 6,139,326. This application Oct. 25, 2000, Appl. No. 696,409.
Int. Cl. G09B *1/00;19/00*
U.S. Cl. 434—167 **13 Claims**



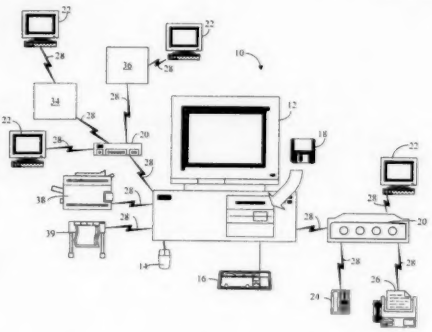
1. A method of assessing the skills of an individual, comprising:
providing a deck of cards having a plurality of separated cards not attached to one another, each of the cards displaying at least one predetermined symbol, the cards having an asymmetrical outline shape and a plurality of subsets wherein each of the subsets is designated by a respective color;
displaying the cards to the individual in a first predetermined manner;
separating the cards into the subsets according to color;
displaying the cards in at least one of the subsets in a second predetermined manner;
asking the individual a plurality of questions about the displayed cards;
recording the individual's responses to the questions; and
assessing the skills of the individual by comparing the individual's responses to predetermined criteria.

US 6,409,513 B1
METHOD FOR IMPROVING READING SPEED AND COMPREHENSION SKILLS
Akihiro Kawamura, Ooamishirasato-Machi, Japan, and Jeffrey C. Flamm, Salt Lake City, Utah, assignors to Infinite Mind, L.C., Salt Lake City, Utah
Provisional application No. 60/167,342, filed on Nov. 24, 1999. This application Mar. 22, 2000, Appl. No. 533,646.
Int. Cl. G09B *17/00;17/04*
U.S. Cl. 434—178 **30 Claims**



1. A method for utilizing a computer software program in order to increase reading speed and improve comprehension of a reader by pushing the reader to read beyond a current capability, and then easing back to a more comfortable reading rate that is faster than an original reading rate, the method comprising the steps of:
(1) displaying text and having the reader read the text at a first speed for a first period of time;
(2) displaying text and having the reader read the text at a second speed for a second period of time, wherein the second speed is faster than the first speed; and
(3) displaying text and having the reader read the text at a third speed for a third period of time, wherein the third speed is faster than the first speed and slower than the second speed.

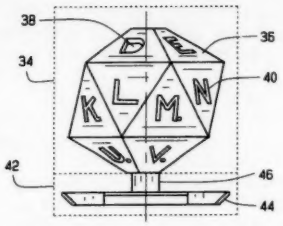
US 6,409,514 B1
METHOD AND APPARATUS FOR MANAGING TRAINING ACTIVITIES
Jeffrey A. Bull, Nampa, Id., assignor to Micron Electronics, Inc., Nampa, Id.
Filed Oct. 16, 1997, Appl. No. 951,903
Int. Cl. G09B *19/00*
U.S. Cl. 434—219 **28 Claims**



1. A method for managing worker training activities, the method comprising:
tracking training information associated with a plurality of workers;
tracking information regarding one or more available classes for the plurality of workers to attend;
comparing the training information for one or more of the plurality of workers with the available classes information; and
automatically electronically contacting the one or more workers regarding attending at least one of the one or more available classes in response to the act of comparing.

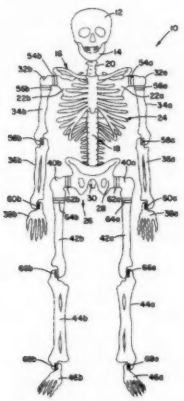
US 6,409,515 B1
IMAGING SYSTEM PHANTOM
James L. Persohn, Nashotah; Donald E. Kosak, Menomonee Falls, and Lance L. Lightfoot, Waukesha, all of Wis., assignors to General Electric Company, Schenectady, N.Y.
Filed Aug. 3, 1999, Appl. No. 366,672
Int. Cl. G09B *23/28*
U.S. Cl. 434—262 **29 Claims**

1. A phantom for use with an imaging system, said phantom comprising:
a plurality of segments, each said segment coupled to at least one other said segment to enclose a volume, each said segment having a segment identifier outlining an opening through the segment, said segment identifier uniquely identifying said segment relative to other said segments;
an inner plate positioned within said volume, said inner plate coupled to at least one said segment and having a plate identifier outlining an opening through said inner plate; and



at least one inner block positioned within said volume, each said inner block disposed upon said inner plate and having a block identifier outlining an opening through said inner block.

US 6,409,516 B1
POSABLE SKELETON
Gerald D. Thill, 100 SE. Second St. #1102, Minneapolis, Minn. 55414
Filed Jan. 7, 2000, Appl. No. 479,683
Int. Cl. G09B *23/28*
U.S. Cl. 434—274 **23 Claims**



1. A simulated posable skeleton comprising:

a. bones and bone groups simulating a human skeleton, the bone groups defining leg limbs and arm limbs, and a body,

b. joints connecting said bones and bone groups so that the connected bones and bone groups are able to be moved rotatably relative to one another, the joints distributed in the arm limbs and leg limbs, respectively, so that each limb has two joints remote from the body, one respective arm and leg limb joint having an axis of rotation which remains generally parallel to the other remote arm and leg limb joint, a third joint connecting each of the arm and leg limbs to the body, and a fourth joint positioned between the third joint and the other two joints, the fourth joint having an axis transverse to the third joint, the combination of joints in each of the limbs enabling the positioning of the bones and bone groups to simulate human postures, and

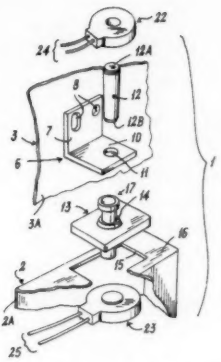
c. positioning means located at each of the four joints on each limb which enables the bones and bone groups to maintain selected positions, the positioning means comprising

opposed toothed members each having opposed radially arranged interfitting teeth, the teeth shaped to inhibit rotation when engaged together and to permit rotation under rotational force applied to the bone or bone groups to which the toothed members are rigidly affixed,

means to provide axial support and connection of the members, and

means resiliently urging the toothed members together such that the members are axially yieldable to permit relative rotation.

US 6,409,517 B2
DEVICE FOR ELECTRICALLY POWERING PRESENT ON A PART OF HOUSEHOLD ELECTRICAL APPLIANCE WHICH IS MOVEABLE RELATIVE TO THE MAIN STRUCTURE OF THIS LATTER
Roberto Malnati, Bodio Lomnago, Italy, assignor to Whirlpool Corporation, Michigan
Filed Jul. 2, 2001, Appl. No. 897,862
Claims priority, application Italy, Jul. 4, 2000, M1000400 U
Int. Cl. H01R *11/30*
U.S. Cl. 439—38 **5 Claims**



1. A household electrical appliance having a door and a main structure, and a hinge for movably mounting the door to the main structure including a magnetic induction transformer for electrically coupling one or more electrical devices on said door with electrical elements on said main structure comprising:

a first hinge member mounted to said door and having hinge pin hole;

a second hinge member mounted to said main structure and having a hinge pin hole;

a first winding carried on said door adjacent said first hinge member;

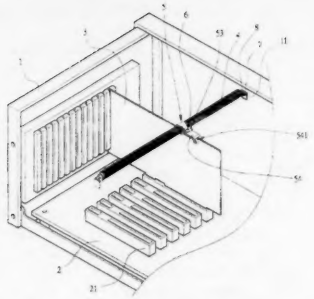
a second winding carried on said main structure adjacent said second hinge member; and

an elongated metal hinge pin that is positioned in the hole in said first hinge member and is positioned through the hole in said second hinge member to hinge said door to said main structure, said first winding being disposed adjacent one end of said hinge pin and said second winding being disposed adjacent the other end of said hinge pin such that said metal hinge pin forms the core for said transformer.

US 6,409,518 B1
PERSONAL COMPUTER ADD-ON CARD STABILIZER
Kuo-Chuan Hung, Lu-Chou, Taiwan, assignor to Chun Long Metal Co., Ltd., Lu-Chou, Taiwan
Filed Mar. 26, 2001, Appl. No. 816,332
Int. Cl. H01R *12/00*
U.S. Cl. 439—61 **1 Claim**

1. A personal computer add-on card stabilizer comprising:

a transverse rod being inside of a computer case and above the expansion slot location of a mainboard, said transverse rod being fitted with zigzag notches externally;



a plurality of mounting rings wrapping around said transverse rod, zigzag notches being formed on the inner circumference of said mounting rings, said mounting ring having an opening, an upper edge and a fastening arm while said upper edge and said fastening arm are formed on the top and bottom of said opening, a small slot being located at the end of said fastening arm, a top of the add-on card inlaying into said small slot,

a screw passing through said upper edge to said fastening arm to fasten said mounting ring firmly on said transverse rod, said fastening arm being on the top of the add-on card, thereby pressing the add-on card firmly; and

a connection plate inserted into a flat aperture of said transverse rod, a screw passing through said connection plate and a mounting bracket to said transverse rod for a firm fixing to computer case.

US 6,409,519 B1

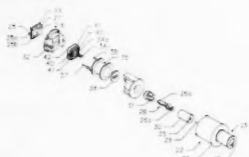
CIRCUIT BOARD CONNECTABLE RF RELAY

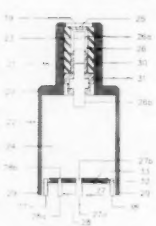
Louis Bacon, Laval, Canada, assignor to Electroline Equipment Inc., Montreal, Canada

Filed Dec. 19, 2001, Appl. No. 20,878

Int. Cl. H01R *9/09*

U.S. Cl. 439—63 **10 Claims**





1. A circuit board connectable RF relay that is connectable to a printed circuit board, which printed circuit board has a ground and has multiple conducting paths, comprised of:

(a) a metal housing having a top portion and a bottom portion, wherein there is a cavity in the top portion called the upper cavity, and wherein there is a cavity in the bottom portion called the lower cavity, and wherein there is an aperture in the top end of the upper cavity, and wherein the metal housing is able to be grounded when the circuit board connectable RF relay is connected to a printed circuit board;

(b) a first RF signal input/output means, which has a first end and a second end;

(c) a second RF signal input/output means, which has a first end and a second end;

(d) wherein the first RF signal input/output means is located in the upper cavity of the metal housing such that its first end is continuous with the aperture in the top end of the upper cavity, and its second end is continuous with the lower cavity;

(e) wherein the second RF signal input/output means is located in the lower cavity of the metal housing such that its first end extends beyond the bottom of the bottom portion of the metal housing, and its second end is situated farther within the lower cavity, and its second end is not in direct conductive contact with the second end of the first RF signal input/output means;

(f) an impedance loading contact;

(g) an RF signal connection means that has a first control signal input and that has a second control signal input and that has a conductive moveable contact member;

(h) a metal bottom housing cover through which a portion of the first control signal input of the RF signal connection means can non-conductivly pass, and through which a portion of the second control signal input of the RF signal connection means can non-conductivly pass;

(i) wherein the RF signal connection means is situated in the lower cavity of the metal housing, such that its conductive moveable contact member is able to be placed simultaneously in conductive contact with the second end of the first RF signal input/output means and the second end of the second RF signal input/output means, and such that its conductive moveable contact member is able to be placed such that it does not provide a conductive path between the second end of the first RF signal input/output means and the second end; of the second RF signal input/output means and that its conductive moveable contact member does provide a conductive path with the impedance loading contact and with the metal bottom housing cover;

(j) a means for securing the bottom end of the bottom portion of the metal housing to a printed circuit board;

(k) a means for connecting the first control signal input of the RF signal connection means to a conducting path of the printed circuit board, when the bottom end of the bottom portion of the metal housing has been secured to the printed circuit board;

(l) a means for connecting the second control signal input of the RF signal connection means to a conducting path of the printed circuit board, when the bottom end of the bottom portion of the housing has been secured to the printed circuit board;

(m) an upper electrical insulating element that is located in the upper cavity of the top of the metal housing which prevents the first RF signal input/output means from coming into conductive contact with the metal housing; and

(n) a lower electrical insulating element which is centrally located within the metal bottom housing cover, which lower electrical insulating element electrically insulates the second RF signal input/output means and the impedance loading contact from the metal bottom housing cover.

US 6,409,520 B1

STRUCTURE AND METHOD FOR INTERCONNECTION OF PRINTED CIRCUIT BOARDS

Bobby J. Self, Colorado Springs, Colo., assignor to Agilent Technologies, Inc., Palo Alto, Calif.

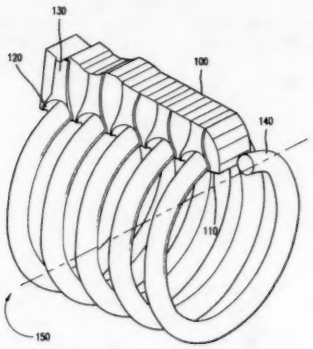
Filed Jul. 31, 2001, Appl. No. 919,431

Int. Cl. H01R *12/00*

U.S. Cl. 439—65 **10 Claims**

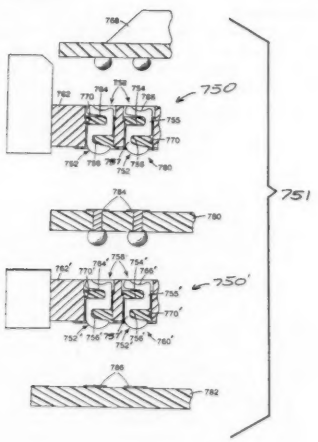
1. A structure for electrically coupling an edge of a first printed circuit board to a side of a second printed circuit board in a substantially perpendicular orientation, the structure comprising:

a plurality of electrically conductive legs, with each leg being soldered within a corresponding plated split hole defined by the edge of the first printed circuit board, each leg having an end extending from each side of the edge of the first printed circuit board, both ends of each leg thus capable of making contact with and being soldered to the side of the second



printed circuit board to provide electrical connectivity between the first and second printed circuit boards.

US 6,409,521 B1
MULTI-MODE COMPLIANT CONNECTOR AND REPLACEABLE CHIP MODULE UTILIZING THE SAME
James J. Rathburn, Maple Plain, Minn., assignor to Gryphics, Inc., Plymouth, Minn.
Continuation-in-part of application No. 09/304,707, filed on May 4, 1999, and a continuation-in-part of application No. 09/182,164, filed on Oct. 29, 1998, which is a division of application No. 08/955,563, filed on Oct. 17, 1997, now Pat. No. 5,913,687, which is a continuation-in-part of application No. 08/852,116, filed on May 6, 1997, now Pat. No. 5,938,451, Provisional application No. 60/063,927, filed on Oct. 31, 1997. This application Oct. 26, 1999, Appl. No. 426,958.
This patent is subject to a terminal disclaimer.
Int. Cl. H05K *12/00*
U.S. Cl. 439—66 **17 Claims**



1. A connector apparatus for electrically connecting first and second circuit members, comprising:

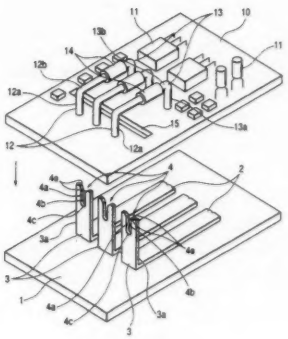
an electrically insulative connector housing adapted for positioning substantially between the first and second circuit members;

a plurality of resilient contact members each having resilient first and second circuit interface portions positioned generally within the connector housing, the resilient contact members comprising a first compliant member;

a resilient, dielectric encapsulating material surrounding a portion of the resilient contact members comprising a second compliant member, whereby the first and second compliant members are capable of providing a first mode of compliance when the contact members are displaced by a circuit member; and

at least one surface on the housing positioned to limit displacement of the contact members such that the contact members elastically deform in the second mode of compliance.

US 6,409,522 B1
CIRCUIT AND BUSBOARD CONNECTION FOR AN ELECTRICAL CONNECTION BOX
Takahiro Onizuka, Nagoya, Japan, assignor to Autonetworks Technologies, Ltd., Nagoya; Sumitomo Wiring Systems, Ltd., Mie, and Sumitomo Electric Industries, Ltd., Osaka, all of Japan
Filed Nov. 22, 2000, Appl. No. 717,064
Claims priority, application Japan, Nov. 24, 1999, 11-332610
Int. Cl. H01R *12/00*
U.S. Cl. 439—74 **4 Claims**



1. A method of forming a circuit in an electrical connection box having an electronic circuit board and an insulating board being stacked and housed in the connection box, the method comprising:

providing a through-hole in the electronic circuit board;

providing a lead wire of an electronic component in a manner straddling the through-hole;

providing at least one bus bar on the insulating board with an upright pressure-contact knife-edge arranged in a position corresponding to the through-hole of the insulating board;

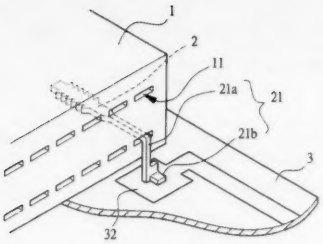
moving the electronic circuit board and the insulating board toward each other in such a condition that the pressure-contact knife-edge passes through the through-hole without having a housing around the pressure contact knife-edge;

stacking the electronic circuit board and the insulating board; and

clamping the wire to the pressure-contact knife-edge by inserting the lead wire into a slot on the pressure-contact knife-edge.

US 6,409,523 B1
TERMINAL LEGS OF CONNECTORS
Hsiao-Lei Shih, Taipei, Taiwan, assignor to Jess-Link Products Co., Ltd., Taipei, Taiwan
Filed Jun. 27, 2001, Appl. No. 891,657
Int. Cl. H01R *9/09*
U.S. Cl. 439—83 **2 Claims**

1. An assembly connector comprising a connector, a circuit board and a plurality of terminals having two ends, said connector



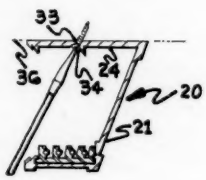
having a plurality of slots forming two rows, one above the other, one end of said terminals having teeth on both sides thereof and being secured in one of said slots, a leg at the other end of said terminals being connected to said circuit board, said leg of each said terminal including a contact column and a contact plate having two portions; one portion of said contact plate being located at a lateral side of said contact column in a plane of said contact column and the other portion of said contact plate extending perpendicularly to said one portion of said contact plate, out of the plane of said contact column, so that when said contact column extends through a hole in said circuit board and said contact column is soldered onto said circuit board at a bottom surface of said circuit board, said other portion of said contact plate engages a surface contact at an upper surface of said circuit board and is secured onto said circuit board by soldering.

US 6,409,524 B1

SIDE-MOUNTED TRACKLIGHT SYSTEM

Jack V. Miller, and Ruth E. Miller, both of 20961 Sussex Hwy. 13, Seaford, Del. 19973

Filed Jul. 30, 2001, Appl. No. 917,516
Int. Cl. H01R *25/00*
U.S. Cl. 439—110 **4 Claims**



1. A tracklight system including:

a generally U-shaped track (**20**) comprising an elongated metal extrusion (**21**) having a canted base (**22**) extending between a first parallel leg (**24**) extending at an acute angle from the base (**22**) to a first distal end (**27**) and a second parallel leg (**26**) extending at an obtuse angle from the base (**22**) to a second distal end (**29**);

a drill guide on the first parallel leg for attaching the first parallel leg (**24**) to a wall or ceiling;

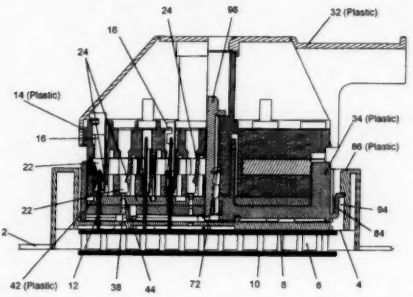
an elongated insulator (**30**) attached to the second parallel leg (**26**) and extending along a length of the track (**20**), the insulator having a number of longitudinal slots (**31**), each said slot including one or more electrical conductors (**35**) receiving power from a remote power source.

US 6,409,525 B1

TERMINAL POSITION HOUSING ASSEMBLY

Wolfgang Hoelscher, Stokesdale; Paul P. Siwinski, Clemmons, and Bobby G. Ward, King, all of N.C., assignors to Tyco Electronics Corporation, Middletown, Pa.

Filed Dec. 11, 2000, Appl. No. 734,088
Int. Cl. H01R *13/44*
U.S. Cl. 439—140 **29 Claims**



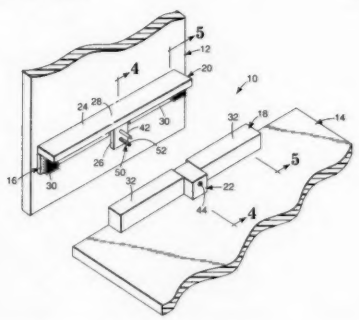
1. An apparatus for aligning an array of male terminals, the apparatus comprising: a stationary plate having a plurality of first apertures dimensioned to permit passage of male terminals through the first apertures without being secured thereto, and an alignment plate having a plurality of second apertures dimensioned to permit passage of male terminals through the second apertures without being secured thereto, said alignment plate being shiftable toward said stationary plate, the alignment plate being constrained relative to the stationary plate so that male terminals are progressively aligned when inserted through the first apertures and then through the second apertures.

US 6,409,526 B1

MECHANISM FOR ENGAGING AND DISENGAGING PRINTED CIRCUIT BOARD CONNECTORS

Christopher G. Malone, Folsom; Glenn C. Simon, Auburn, and Dennis C. Thompson, deceased, late of Roseville, all of Calif., by Leanna V. Thompson, legal representative, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 3, 2000, Appl. No. 678,079
Int. Cl. H01R *13/62*
U.S. Cl. 439—160 **19 Claims**



1. A mechanism for use in insertion and extraction of an electrical connector of a first printed circuit board (PCB) to and from a corresponding electrical connector of a second PCB, the insertion and extraction mechanism comprising:

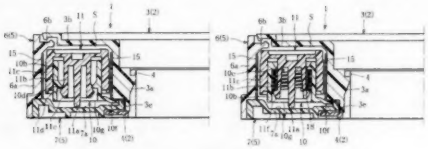
a first member affixed to the first PCB immediately adjacent to the electrical connector, wherein the first member stiffens the first PCB in the vicinity of the electrical connector;

a second member affixed to the second PCB immediately adjacent to the corresponding electrical connector;

a movable fastener engageable with the first and second members, wherein movement of the fastener in a first direction causes the electrical connector of the first PCB to be inserted to the corresponding electrical connector of the second PCB, and wherein movement of the fastener in a second direction causes the electrical connector of the first PCB to be extracted from the corresponding electrical connector of the second PCB; and

a guide element engageable between only the first and second members so as to be free of any engagement with the electrical connector and the corresponding electrical connector, the guide element insuring that the electrical connector and the corresponding electrical connector are properly aligned with one another during insertion and extraction of the electrical connector of the first PCB to and from the corresponding electrical connector of the second PCB.

US 6,409,527 B1
REDUCED NOISE ROTATING CONNECTOR
Ryoichi Adachi, Kameyama, and Yoshimi Noro, Aichi, both of Japan, assignors to The Furukawa Electric, Co., LTD, Japan
Filed Oct. 20, 2000, Appl. No. 693,579
Claims priority, application Japan, Oct. 22, 1999, 11-301181
Int. Cl. H01R *3/00*
U.S. Cl. 439—164 **7 Claims**



1. A rotating connector comprising:

a first case and a second case, which are combined to be rotatable relative to each other and define an annular space inside;

a ring member supporting a plurality of rollers arranged in a circumferential direction within the annular space, the ring member being movable in the circumferential direction within the annular space; and

a spirally wound belt-shaped transmission line, where the transmission line is inverted by one of the rollers, a first end and a second end of the spirally wound transmission line being connected to the first case and to the second case respectively;

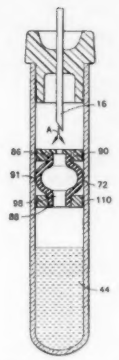
wherein the second case has a bottom plate;

wherein one or more of the rollers has an abutting shaft to be abutted against the bottom plate, wherein the ring member is interposed between the rollers and the bottom plate, wherein the abutting shaft extends through the ring member, and wherein the abutting shaft maintains a face of the ring member opposing the bottom plate out of contact with the bottom plate.

US 6,409,528 B1
DEVICE AND METHOD FOR COLLECTING, PREPARATION AND STABILIZING A SAMPLE
Kenneth J. Bodnar, Bethlehem, Pa., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.
Provisional application No. 60/169,166, filed on Dec. 6, 1999. This application Apr. 27, 2000, Appl. No. 560,061.
Int. Cl. G01N *1/18*
U.S. Cl. 439—177 **16 Claims**

9. A method for collection of fluid samples comprising:

providing a sample collection tube having an open end, a closed end, and a sidewall extending therebetween defining a space, said side wall having an inner surface and an outer surface;



pre-loading the tube with testing reagent, wherein the test reagent is a buffered lysing solution for preparing and stabilizing nucleic acid;

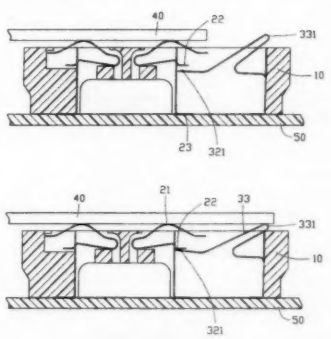
providing a safety separator having a seal body for sealing engagement with the inner surface of the tube, said separator having a density greater than the testing reagent and spaced from the open end to define a sample collection portion of the container that is seperated from the reagents by the separator, and being deformable under centrifugal force;

inserting a resealable closure into the open end of the tube;

adding a fluid sample through the resealable closure; and

centrifuging the tube, to deform the seal body, move the separator down toward the closed end, so as to mix the sample and the testing reagent.

US 6,409,529 B1
SIM CARD CONNECTOR WITH IMPROVED GROUNDING PIN
Jun Xian Liu; Shaoping Du, and Jian Qiang Zhang, all of Kunsan, China, assignors to Hon Hai Precision Ind. Co., Ltd., Taipei Hsien, Taiwan
Filed Jun. 5, 2001, Appl. No. 875,626
Claims priority, application Taiwan, Apr. 30, 2001, 90206961 U
Int. Cl. H01R *29/00*
U.S. Cl. 439—188 **6 Claims**



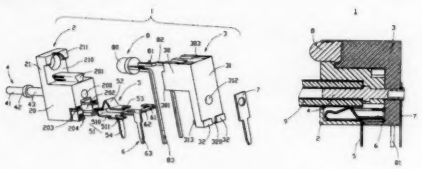
1. A Subscriber Identity Module (SIM) card connector comprising:

an insulative housing defining a front and a rear rows of recesses on a top surface thereof;

a plurality of terminals retained in the recesses, each terminal having a contact portion extending beyond the top surface of the housing, one of the terminals being a grounding terminal, the grounding terminal having an abutment leg; and

a grounding pin having a mounting portion retained in one of the front row recesses, a solder portion adapted for contacting grounding pad of a printed circuit board, an abutment portion located below the abutment leg of the grounding terminal, and a folded contact portion between the mounting portion and the abutment portion, the folded contact portion having a transitional portion extending beyond the top surface of the housing in front of the contact portions of the terminals, the transitional portion of the folded contact portion being rearwardly and downwardly moveable by a SIM card to move the abutment portion upwardly to abut the abutment portion of the grounding terminal.

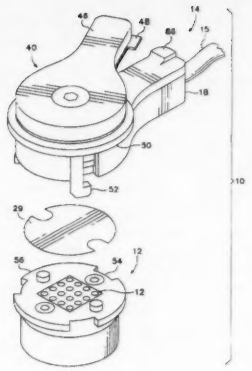
US 6,409,530 B1
POWER JACK
Qijun Zhao; ZiQiang Zhu, and Jinkui Hu, all of Kunsan, China, assignors to Hon Hai Precision Ind. Co., Ltd., Taipei Hsien, Taiwan
Filed Nov. 28, 2001, Appl. No. 997,035
Int. Cl. H01R *29/00*
U.S. Cl. 439—188 **8 Claims**



1. A combination of a power jack mounted on a printed circuit board (PCB) and a complementary plug connector having a contact, the power jack comprising:
an insulative housing;
a mating contact assembled in the insuiative housing for mating with the plug connector;
a spring contact assembled in the insulative housing and adapted for being connected to the PCB;
a switch contact assembled in the insulative housing and electrically engaged with the spring contact before the mating contact is engaged with the contact of the complementary plug connector;
a tail contact electrically connected with the mating contact and adapted for being connected to the PCB; and
a light-emitting diode (LED) assembled on the insulative housing for indicating the working status of the power jack; wherein
when the contact of the complementary plug connector is inserted into the insulative housing and engages with the mating contact and the spring contact, the spring contact disengages from the switch contact;
wherein the insulative housing comprises a front housing and a rear housing assembled to the front housing;
wherein the front housing comprises a bottom base and a top portion extending from a front end of the bottom base, and the rear housing comprises a top base assembled on the bottom base of the front housing and a vertical portion extending downwardly from a rear end of the top base.

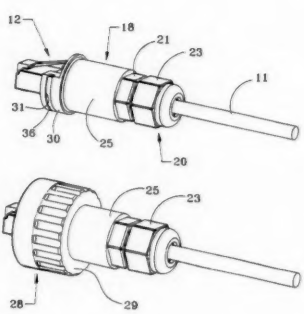
US 6,409,531 B1
EASILY MATED COMPACT CONNECTOR
Kenneth Boyd Millard, Portland, Oreg., assignor to MicroHelix, Inc., Portland, Oreg.
Filed Feb. 12, 2001, Appl. No. 781,740
Int. Cl. H01R *13/28;25/00*
U.S. Cl. 439—289 **4 Claims**

1. An electrical connector, comprising:
a) a first pressure surface bearing a first array of contact pads;



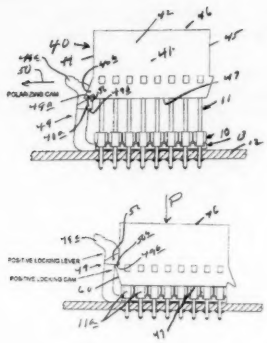
b) a second pressure surface bearing a second array of contact pads; and
c) a pressure applying device for pressing said first pressure surface into said second pressure surface, said pressure applying device including:
(i) a ball screw including a race having a plurality of grooves, each groove accommodating a ball bearing; and
(ii) a manual actuator permitting a user to turn said ball screw to press said first pressure surface into said second pressure surface.

US 6,409,532 B2
FIELD-ATTACHABLE IN-LINE SIGNAL CONNECTOR WITH PROTECTIVE MOLDED COVER
Brian D. Payson, Bolton, Mass., and Mark E. Fillion, Rumford, R.I., assignors to Woodhead Industries, Inc., Deerfield, Ill.
Provisional application No. 60/188,966, filed on Mar. 10, 2000. This application Mar. 8, 2001, Appl. No. 802,177.
Int. Cl. H01R *4/38*
U.S. Cl. 439—320 **7 Claims**



1. An apparatus for field conversion of an in-line connector and an associated cable to industrial applications, comprising:
a protective body including a compression seal, said body defining a central opening for receiving said cable and a receptacle for housing said connector;
a female compression nut adapted to be received on said male portion to form a seal with said cable;
a clip including a tab adapted to couple said connector to said protective body; and
a coupling nut received on said protective body for threaded engagement with a male member of a mating connector.

US 6,409,533 B1
CONNECTOR LOCKING OF TERMINAL PINS AND HEADER
John M. Savage, Jr., 538-B Via De La Valle, Solana Beach, Calif. 92075
Filed May 7, 2001, Appl. No. 849,411
Int. Cl. H01R *13/627*
U.S. Cl. 439—358 **22 Claims**



1. Apparatus connectable to a PC board comprising in combination

a) at least one row of mounting terminals be received in openings in the board,

b) header structure associated with said row of terminals,

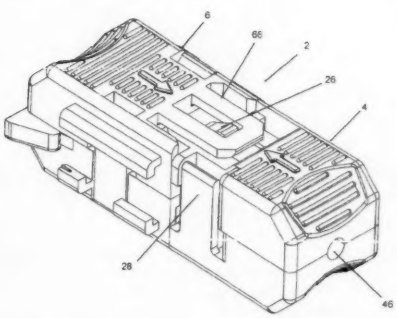
c) support structure having openings to pass said terminals, and support said header structure,

d) and connector structure to interfit the terminals and interlock to the support structure,

e) said connector structure adapted to carry wire terminals electrically connectable to said mounting terminals,

f) the header structure including multiple heads respectively associated with said mounting terminals, certain pairs of said heads extending in adjacent relation and defining reduced thickness break-away structure.

US 6,409,534 B1
COAX CABLE CONNECTOR ASSEMBLY WITH LATCHING HOUSING
Adam Weisz-Margulescu, Thornhill, Canada, assignor to Tyco Electronics Canada Ltd., Ontario, Canada
Filed Jan. 8, 2001, Appl. No. 756,160
Int. Cl. H01R *13/62*
U.S. Cl. 439—367 **21 Claims**



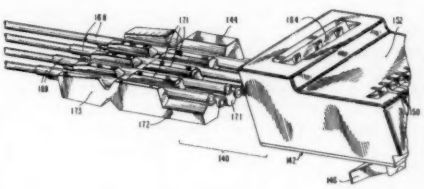
1. A press-fit type coaxial connector assembly comprising a plug coaxial assembly matable with a jack coaxial assembly, wherein:

the plug coaxial assembly comprises a plug coaxial connector and a molded plug housing comprising first and second plug housing components latched together around the plug coaxial connector, and;

the jack coaxial assembly comprises a jack coaxial connector and a molded jack housing comprising first and second jack housing components latched together around the jack coaxial connector; wherein

the plug coaxial connector is latched to the jack coaxial connector when mated and wherein the molded plug housing is separately latched to the molded jack housing when the plug coaxial assembly is mated to the jack coaxial assembly.

US 6,409,535 B1
MODULAR ELECTRICAL PLUG AND PLUG-CABLE ASSEMBLY INCLUDING THE SAME
Richard Marowsky, York; Robert Colantuono, Dover, and Ronald Locati, York, all of Pa., assignors to Stewart Connector Systems, Inc., Glen Rock, Pa.
Filed Feb. 8, 1999, Appl. No. 246,166
Int. Cl. H01R *4/24*
U.S. Cl. 439—418 **19 Claims**



1. A modular plug for terminating a cable having wires, comprising:

a housing defining a plurality of terminal-receiving slots, said housing having a longitudinal cavity extending from a rear surface of said housing inward to a forward portion of said housing below the terminal-receiving slots, wherein a forward portion of said cavity situated in said forward portion of said housing below the terminal-receiving slots includes a plurality of upper pairs of opposed surfaces situated in an upper level and a plurality of lower pairs of opposed surfaces situated in a lower level,

contact terminals situated in said slots, and

a load bar having a rearward portion and a forward portion structured and arranged to be inserted in said cavity, said forward portion of said load bar being defined by a plurality of projections each having three arcuate surfaces, wherein one of said arcuate surfaces of each projection forms one of a plurality of channels in an upper level receivable of a wire and wherein another of said arcuate surfaces of each projection forms one of a plurality of channels with an arcuate surface of an adjacent projection in a lower level receivable of a wire, said forward portion of said load bar structured and arranged to be situated in said forward portion of said cavity below said terminal-receiving slots, said upper pairs of opposed surfaces of said forward portion of said cavity receiving respective wires in said upper channels of said load bar between them and said lower pairs of opposed surfaces of said forward portion of said cavity receiving respective wires in said lower channels of said load bar,

wherein said plurality of upper channels includes at least first and second channels and said plurality of lower channels includes at least third and fourth channels.

US 6,409,536 B1

CONNECTOR STRUCTURE

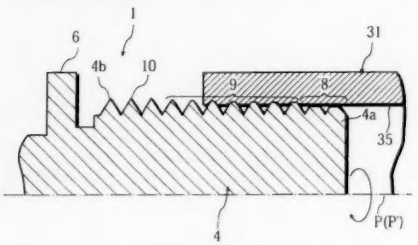
Takayoshi Kanda, and Nobuyoshi Matsuda, both of Fukui, Japan, assignors to Mitsubishi Cable Industries, Ltd., Amagasaki, Japan

Division of application No. 09/664,742, filed on Sep. 19, 2000, now Pat. No. 6,332,808. This application Aug. 16, 2001, Appl. No. 930,264.

Claims priority, application Japan, Sep. 22, 1999, 11-269281; Feb. 25, 2000, 2000-049415

Int. Cl. H01R *4/24;4/26;11/20*

U.S. Cl. 439—429 **2 Claims**



1. A connector structure comprising a coaxial connector having an inner contact and an outer contact respectively connected to an inner conductor and an outer conductor of a coaxial cable coaxially having the inner conductor and the outer conductor respectively insulated, wherein the inner contact has a single thread tapping screw portion screwed into an inner peripheral face of the inner conductor with self screw cutting, and the tapping screw portion has a guiding portion formed parallel to an axis and having an outer diameter substantially equal to an inner diameter of the inner conductor on a forward end, a chamfer portion for self screw cutting is formed by cutting threads on a base end side to the guiding portion of the tapping screw portion with a predetermined angle, and said chamfer portion has a length greater than a length of said guiding portion.

US 6,409,537 B2

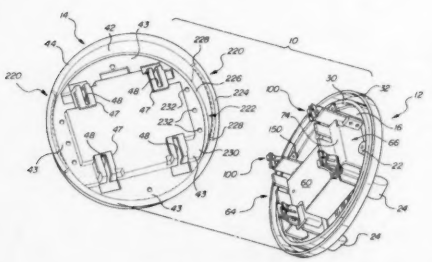
WATTHOUR METER SOCKET ADAPTER WITH AUXILIARY COMPONENT MOUNTS

Darrell Robinson, Highland Township, and Allen V. Pruehs, Howell, both of Mich., assignors to Ekstrom Industries, Inc., Farmington Hills, Mich.

Continuation of application No. 09/327,022, filed on Jun. 7, 1999, now Pat. No. 6,152,764. This application Dec. 15, 2000, Appl. No. 738,480.

Int. Cl. H01R *33/945*

U.S. Cl. 439—517 **22 Claims**



1. A watthour meter socket adapter including a housing having a base wall and a sidewall extending from the base wall, the socket adapter comprising:

at least one pair of opposed slots carried in the housing and adapted for supporting a circuit board in a substantially perpendicular orientation with respect to the base wall of the housing.

US 6,409,538 B1

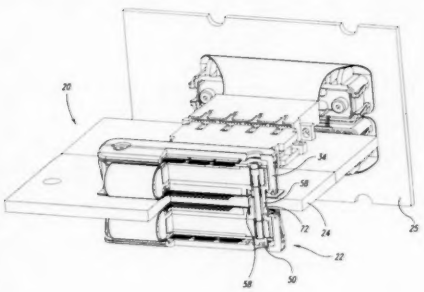
ELECTRICAL CONNECTOR ASSEMBLY FOR USE WITH VARIABLE THICKNESS CIRCUIT BOARDS

Alexander I. Yatskov, Kenmore, and Stephen V. R. Hellriegel, Bainbridge Island, both of Wash., assignors to Cray Inc., Seattle, Wash.

Continuation-in-part of application No. 09/705,386, filed on Nov. 3, 2000. This application Nov. 28, 2000, Appl. No. 724,790.

Int. Cl. H01R *13/60;13/66;12/00;* **H05K** *1/00*

U.S. Cl. 439—567 **24 Claims**



1. An apparatus comprising:

a printed circuit board;

an aperture extending through the printed circuit board;

a casing having a first alignment assembly for extending into the aperture, the alignment assembly having a plurality of alignment members positioned for extending into the aperture, the alignment members having an outside surface that contacts the walls of the aperture to align the casing with respect to the printed circuit board, the alignment members having a space between them; and

a mating member having a second alignment assembly for extending into the aperture from the opposite direction of the first alignment assembly, the second alignment assembly having a plurality of members that extend into the space between the alignment members of the first alignment assembly and having a space between them into which the alignment members of the first alignment assembly extend.

US 6,409,539 B1

ELECTRICAL CONNECTOR SECURELY MOUNTED ON A PRINTED CIRCUIT BOARD

GuangXing Shi, and Suiya Wang, both of Kunsan, China, assignors to Hon Hai Precision Ind. Co., Ltd., Taipei Hsien, Taiwan

Filed Mar. 16, 2001, Appl. No. 810,832

Claims priority, application Taiwan, Dec. 30, 2000, 89222912 U

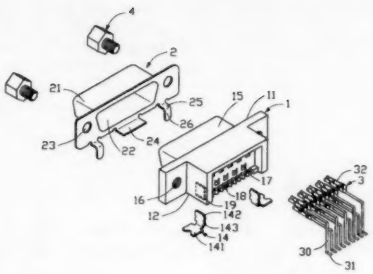
Int. Cl. H01R *13/60*

U.S. Cl. 439—567 **4 Claims**

1. An electrical connector mounted on a printed circuit board for mating with a mating connector, comprising:

an insulating housing having a front mating face and a bottom surface, the front mating face being adapted to engage a mating connector inserted along a direction parallel to a printed circuit board;

a plurality of contacts received in the insulating housing;



a shield secured to the insulating housing and enclosing the front mating face, the shield having a soldering pad at a bottom, rear edge thereof extending parallel to the printed circuit board and adapted for being secured on the printed circuit board, and a pair of boardlocks formed at the bottom thereof beside the soldering pad for securing the connector to the printed circuit board; and

a pair of bolts for connecting the shield and the insulating housing.

US 6,409,540 B1

CONNECTOR HAVING A GUIDE RIB WITH A HOLLOWED GROOVE PORTION

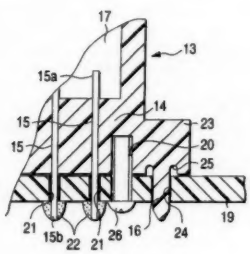
Shinji Kodama, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Feb. 13, 1998, Appl. No. 23,198

Claims priority, application Japan, Feb. 14, 1997, 9-030827

Int. Cl. H01R *13/64;13/73;* **H02B** *1/01*

U.S. Cl. 439—573 **8 Claims**



1. A connector comprising:

a connector housing;

a terminal provided on a bottom face of said connector housing and connected to a printed circuit board;

a guide rib protruding from said bottom face of said connector housing;

a hollow groove portion formed around a base potion of said guide rib on said bottom face of said connector housing; and

a screw hole, for fixing said connector housing to said printed circuit board, provided on said bottom face of said connector housing;

wherein the position of said connector housing with respect to said printed circuit board is determined by said guide rib.

US 6,409,541 B1

WATERPROOF STRUCTURE IN CABLE INSERTION SECTION, METHOD OF MANUFACTURING THE SAME, AND DIE FOR WATERPROOF MOLDING

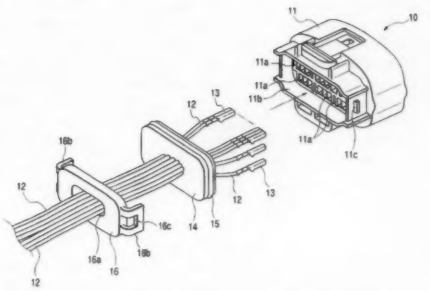
Yasuhiro Hattori, and Hirotaka Yamada, both of Nagoya, Japan, assignors to Autonetworks Technologies, Ltd., Nagoya; Sumitomo Wiring Systems, Ltd., Mie, and Sumitomo Electric Industries, Ltd., Osaka, all of Japan

Filed Oct. 31, 2001, Appl. No. 984,919

Claims priority, application Japan, Nov. 2, 2000, 2000-335968; Jan. 19, 2001, 2001-011934

Int. Cl. H01R *13/40*

U.S. Cl. 439—587 **2 Claims**



1. A waterproof structure in a cable insertion section, wherein an inner peripheral surface of the cable insertion section and an outer peripheral surface of a cable member are sealed together in a cable-inserted state in which connector terminals of cable members connected to ends of individual conductors are inserted into the cable insertion section formed in a housing body and are provided at predetermined positions, the waterproof structure comprising:

a plug molded on the outer peripheral surfaces of the cable members situated in the cable insertion section and detachably fitted into the cable insertion section with a slight gap between the inner peripheral surface of the cable insertion section and the plug; and

a elastically deformable annular sealing body retained in a retention groove formed along an outer peripheral surface of the plug and brought into close contact with the inner peripheral surface of the cable insertion section.

US 6,409,542 B1

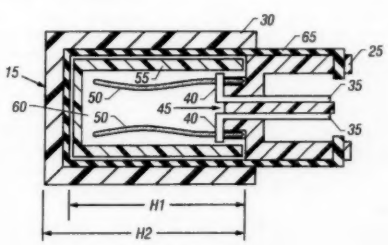
ELECTRICALLY SHIELDED CONNECTOR WITH OVER-MOLDED INSULATING COVER

James W. Ivey, Jr., Wendell, N.C., and Keith Bass, Redding, Calif., assignors to Alcatel, societe anonyme, France

Filed Mar. 19, 2001, Appl. No. 812,080

Int. Cl. H01R *13/648;13/42*

U.S. Cl. 439—607 **32 Claims**



1. A shielded cable assembly, comprising:

a connector body including a wire attachment region;

a contact member including a wire attachment portion, the contact member being mounted on the connector body with the wire attachment portion positioned adjacent to the wire attachment region of the connector body;

an insulating insert including a cavity having an open end and a closed end, wherein the insulating insert is positioned adjacent to the connector body with at least a portion of the wire attachment portion of the contact member positioned within the cavity and wherein an insulating insert shut-off surface adjacent to the open end of the insulating insert is engaged with a mating shut-off surface of the connector body thereby defining a shut-off interface that limits the flow of an over-molded insulating cover material into the cavity during an over-molding operation;

a cable including a wire, the wire extending into the cavity of the insulating insert and being electrically connected to the wire attachment portion of the contact member;

a shielding body including an insert-receiving region, wherein at least a portion of the insulating insert is positioned in the insert-receiving region and at least a portion of the shielding body is mounted directly on the connector body; and

an over-molded insulating cover covering at least a portion of the shielding body.

US 6,409,543 B1

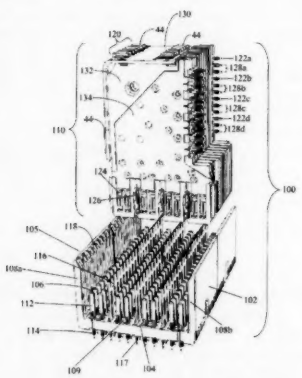
CONNECTOR MOLDING METHOD AND SHIELDED WAFERIZED CONNECTOR MADE THEREFROM

Allan L Astbury, Jr., Amherst, and Thomas S. Cohen, New Boston, both of N.H., assignors to Teradyne, Inc., Boston, Mass.

Filed Jan. 25, 2001, Appl. No. 769,868

Int. Cl. H01R *13/648*

U.S. Cl. 439—608 **23 Claims**



1. A method of manufacturing an electrical connector assembled from wafers, including a process of manufacturing the wafers comprising:

a) providing a shield plate having an upper surface and a lower surface, the shield plate having a plurality of contact tails extending therefrom, the contact tails connected to the shield plate through a portion bent to raise the contact tail above the plane of the shield plate;

b) providing a first dielectric housing on the shield plate, the first dielectric housing having a cavity and a plurality of openings extending from the cavity and the first dielectric housing also encapsulating the bent portions attaching the contact tails to the shield plate;

c) providing a plurality of signal contacts, each of the signal contacts having a contact tail, a contact region and an intermediate portion joining the contact tail and the contact region;

d) inserting the plurality of signal contacts into the first dielectric housing with the intermediate portions in the cavity, the contact regions in one of the plurality of openings and the contact tails extending from the first dielectric housing; and

e) providing a second dielectric housing substantially over the cavity, thereby securing the shield, the first dielectric housing and the signal contacts together as a wafer, whereby the contact tails of the shield plate and the signal contacts are secured.

US 6,409,544 B1

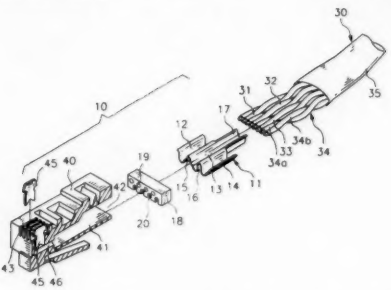
NETWORK DATA TRANSMISSION CABLE CONNECTOR

Chin Hsing Wu, Taipei, Taiwan, assignor to Lorom Industrial Co., Ltd., Taipei, Taiwan

Filed May 23, 2001, Appl. No. 862,518

Int. Cl. H01R *13/648;11/20;4/24;4/26*

U.S. Cl. 439—608 **3 Claims**



1. A network data transmission cable connector adapted to receive electrically insulated conductors of twisted pairs of a cable having a protective outer sleeve and 4 twisted pairs in the protective outer sleeve, comprising:

a connector plug, said connector plug comprising a backwardly extended mounting chamber adapted to receive the twisted pairs of the cable, a back opening through which the twisted pairs of the cable are inserted into said mounting chamber, a plurality of horizontal conductor slots respectively forwardly extended from said mounting chamber and adapted to receive the electrically insulated conductors of the twisted pairs of the cable respectively, said horizontal conductor slots being alternatively arranged into two horizontal rows at different elevations, and a plurality of vertical terminal slots respectively disposed at a front side thereof in communication with said conductor slots;

a metal shield mounted inside said mounting chamber of said connector plug and separating the twisted pairs of the cable into an upper part supported above said metal shield and a lower part arranged below said metal shield;

a conductor holder block mounted inside said mounting chamber of said conductor plug and disposed in front of said metal shield and adapted to guide the electrically insulated conductors of the twisted pairs of the cable into the conductor slots of said connector plug, said conductor holder block comprising an upper horizontal row of conductor holes and a lower horizontal row of conductor holes alternatively arranged at different elevations for the passing of the electrically insulated conductors of the twisted pairs of the cable; and

a plurality of metal terminals respectively mounted in said vertical terminal slots and adapted to pierce the insulation of each of the electrically insulated conductors of the twisted pairs of the cable to make a respective electric contact, wherein said metal shield comprises a first longitudinal groove, a second longitudinal groove, and a third longitudinal groove respectively disposed on a top sidewall thereof and adapted to receive the first, second and third twisted pairs of the cable respectively, a fourth longitudinal groove and a fifth longitudinal groove respectively disposed on a bottom sidewall thereof and receiving the two electrically insulated conductors of a fourth twisted pair of the cable.

US 6,409,545 B1

POWER CAPACITOR

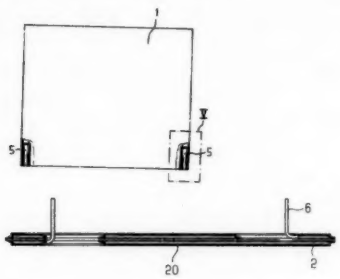
Harald Vetter, and Ludwig Berg, both of Heidenheim, Germany, assignors to Siemens Matsushita Components GmbH & Co. KG, Munich, Germany

Continuation of application No. PCT/DE99/01017, filed on Apr. 1, 1999. This application Oct. 10, 2000, Appl. No. 684,654.

Claims priority, application Germany, Apr. 9, 1998, 198 16 215

Int. Cl. H01R *13/66*

U.S. Cl. 439—620 **18 Claims**



1. A capacitor bank comprising:

a printed circuit board having a first surface and including at least one blade electrical contact, said at least one blade contact defining an end of a conductor, said conductor for conducting electrical current, said end of said conductor being elevated from said first surface; and

at least one capacitor defining a plurality of connection members internal to said at least one capacitor and further defining within at least one of said connection members a plurality of opposing contact leads for receiving said at least one blade contact therebetween, such that said printed circuit board is securely held to said at least one capacitor and electrical contact between said at least one blade contact and said plurality of opposing contact leads exists when said at least one blade contact is disposed between said plurality of opposing contact leads.

US 6,409,546 B1

CARD CONNECTOR

Toshiyasu Ito, Togane, and Noriaki Furuta, Otsu, both of Japan, assignors to Yamaichi Electronics Co., Ltd., Tokyo, and Matsushita Electric Industrial CO, Ltd., Osaka, both of Japan

Filed Nov. 7, 2000, Appl. No. 706,786

Claims priority, application Japan, Nov. 9, 1999, 11-318916

Int. Cl. H01R *24/00*

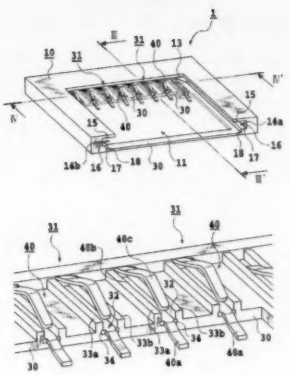
U.S. Cl. 439—630 **6 Claims**

1. A card connector for holding a card, the card having an upper body portion, a lower body portion slightly narrower in width than the upper body portion and formed with a row of a plurality of recessed portions separated by a plurality of partition walls, a plurality of contact pads placed in the recessed portions, and stepped portions formed at both side edges of the card by an underside of the upper body portion and an underside of the lower body portion, the card connector comprising:

a connector housing;

a plurality of contact terminals arranged in the connector housing and elastically deformable to contact the contact pads when the card is inserted into the card connector; and

a plurality of contact supports each made up of a pair of raised portions with a support groove to support the associated contact terminal formed between the raised portions;



wherein an overall width of each of said contact supports is smaller than an interval between said partition walls of the card, and said contact supports are formed projecting from the connector housing at a predetermined pitch corresponding to the interval between said partition walls so that said partition walls of said card fit between said contact supports when the card is inserted into the card connector.

US 6,409,547 B1

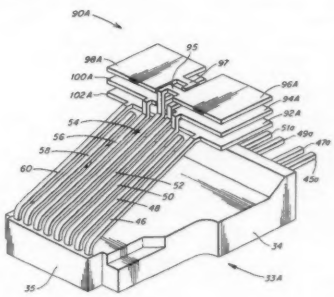
MODULAR CONNECTORS WITH COMPENSATION STRUCTURES

Ivan Reede, Dollard des Ormeaux, Canada, assignor to NORDX/CDT, Inc., Quebec, Canada

Provisional application No. 60/110,595, filed on Dec. 2, 1998. This application Dec. 2, 1999, Appl. No. 452,709.

Int. Cl. H01R *24/00*

U.S. Cl. 439—676 **21 Claims**



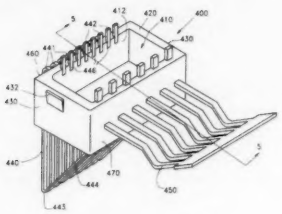
6. A connector providing counter coupling including a plug and a jack having a plug receiving cavity, said jack comprising:

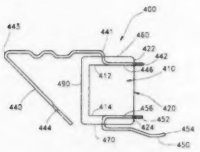
a plurality of contacts juxtaposed side-by-side and arranged in a single row;

said contacts including a cantilever spring contacts mounted to extend into said plug receiving cavity, said cantilever spring contacts having a mounted end and a moveable end; and

at least two of said spring contacts having capacitive coupling elements electrically connected to said moveable ends of said at least two spring contacts and located outside of a conductive path between said jack and said plug, said capacitive coupling elements providing capacitive coupling.

US 6,409,548 B1
MICROELECTRONIC CONNECTOR WITH OPEN-CAVITY INSERT
Aurelio Guttierez, Bonita, Calif., assignor to Pulse Engineering, Inc., San Diego, Calif.
Filed Nov. 2, 2000, Appl. No. 705,454
Int. Cl. H01R *23/02*
U.S. Cl. 439—676 **10 Claims**

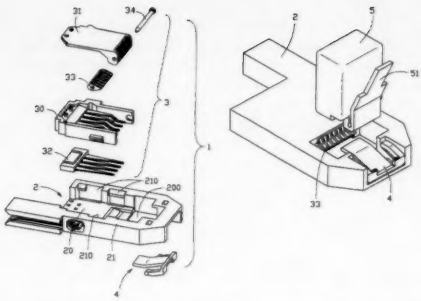




1. A microelectronic connector assembly, comprising:
an insert having a first face and a second face, wherein the first face and second face define a first cavity, said first cavity being configured to receive at least one electrical component;
a plurality of first leads comprising first ends embedded within the first face such that a portion of the first ends of the first leads is exposed to the first cavity so as to make an electrical connection with an electrical component received in the first cavity, the plurality of first leads further comprising second ends extending from said insert, said second ends of the plurality of first leads being configured to provide an electrical connection with a modular plug;
a plurality of second leads comprising first ends embedded within the second face such that a portion of the first ends of the second leads is exposed to the first cavity so as to make an electrical connection with an electrical component received in the first cavity, the plurality of second leads further comprising second ends extending from said insert and configured to provide an electrical connection with a printed circuit board; and
a connector body having a front, a back, and a dividing wall separating said front from said back, said front having a second cavity adapted to receive a modular plug therein, said back having a third cavity for receiving the insert, and said dividing wall having a plurality of openings providing communication between said second cavity and said third cavity, wherein the plurality of first leads are configured to protrude through the plurality of openings into the second cavity.

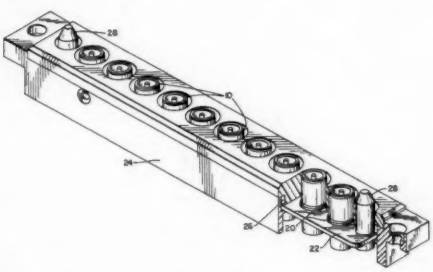
US 6,409,549 B1
ELECTRICAL CONNECTOR
Joel J. Yeh, San Gabrie, Calif., assignor to Hon Hai Precision Ind. Co., Ltd., Taipei Hsien, Taiwan
Filed Oct. 31, 2001, Appl. No. 1,082
Int. Cl. H01R *24/00*
U.S. Cl. 439—676 **10 Claims**

1. An electrical connector for contacting multiple types of connector plugs, comprising:
a slide body defining a receiving space; and
a terminal module received in the receiving space and comprising:
a main base assembled in the receiving space, and comprising an opening in a front end thereof and a plurality of upper contacts extending forwardly into the opening;



a bottom base assembled on the main base and comprising a plurality of lower contacts extending forwardly and alternating with the upper contacts;
a top cover received in the opening of the main base and defining a plurality of ribs at a front end thereof, every two ribs defining a passageway; and
a plurality of terminals pivotably received in the passageways for contacting with the upper and lower contacts; wherein each terminal is substantially a cam-shaped, and comprises a coaxial hole for receiving a pivot;
wherein the electrical connector may contact with any one of the multiple types of connector plugs without damaging the terminals and contacts of the electrical connector.

US 6,409,550 B1
PLANAR BLIND-MATE CONNECTORS
Jiri Splichal, Silver Spring, and Jimmy Fredoon Dholoo, Gaithersburg, both of Md., assignors to MCE/Weinschel Corporation, Frederick, Md.
Filed Nov. 15, 1999, Appl. No. 440,099
Int. Cl. H01R *13/502*
U.S. Cl. 439—701 **4 Claims**



1. Ganged planar face connectors comprising;
a first module,
a first plurality of connector elements having planar face contact surfaces,
said first plurality of connector elements arrayed in said first module,
a second module,
a second plurality of connector elements having planar face contact surfaces,
said second plurality of connector elements arrayed in said second module in the same array as the said first plurality of connector elements in said first module,
a slide located in one of said modules,
said plurality of connector elements of said one of said modules located in said slide,
said slide having a plurality of aligning holes, and
a plurality of aligning pins situated on the other of said modules, said plurality of aligning pins positioned for entering said

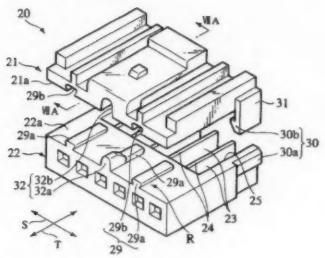
aligning holes and translating said slide to insure proper alignment of said pluralities of connector elements when said modules are mated,

said first plurality of connectors of said first module contacting said second plurality of connectors of said second module on a one-for-one basis upon mating of said modules, thereby defining a plane of contact.

US 6,409,551 B1
PRESS-FIT CONNECTOR

Kentaro Nagai, Shizuoka-ken, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Aug. 4, 2000, Appl. No. 575,723
Claims priority, application Japan, Aug. 6, 1999, 11-224160
Int. Cl. H01R *13/502;13/514*
U.S. Cl. 439—701 **3 Claims**



1. A press-fit connector comprising:

a first connector housing;

a second connector housing;

locking means for locking the first and second housings when the first and second housings are coupled;

a plurality of first partition walls for partitioning the first connector housing into terminal accommodating chambers for accommodating terminals, the first partition walls having tip end faces;

a plurality of second partition walls for partitioning the second connector housing, the second partition walls having tip end faces, wherein the tip end faces of the first partition walls are opposite the tip end faces of the second partition walls when the first and second connector housings are coupled; and

positioning means for bringing the tip end faces of the first and second partition walls into alignment with each other when the first and second connector housings are coupled; and

wherein the positioning means operates prior to operation of the locking means, and

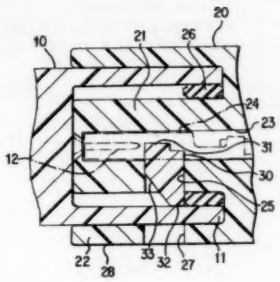
wherein the positioning means extends in a direction of the length of the partition walls.

US 6,409,552 B2
CONNECTOR

Koichi Matsumoto, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed May 1, 2001, Appl. No. 845,314
Claims priority, application Japan, Jun. 2, 2000, 2000-165603
Int. Cl. H01R *13/436*
U.S. Cl. 439—752 **14 Claims**

1. A connector comprising first and second housings mutually engageable in an attachment direction, said first housing having a tubular terminal housing member adapted to house a terminal fitting, and a hood surrounding said terminal housing member to define a continuous channel open in said attachment direction, and said second housing being insertable into said channel on engagement of said first and second housings, wherein said first housing

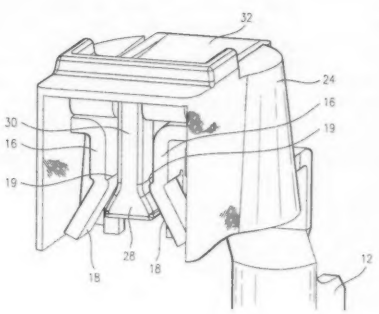


defines a retainer insertion hole extending substantially at right angles to said attachment direction from the exterior of said first housing via said channel into said tubular housing member, and adapted to receive a retainer, said retainer being insertable through said retainer insertion hole from a waiting position to a final position in which in use the retainer protrudes into said tubular housing member to retain a terminal fitting against removal, wherein one of, said retainer and second housing is provided with an inclined face for contact with the other of said retainer and second housing whereby insertion of said second housing into said channel moves said retainer from the waiting position to the final position.

US 6,409,553 B1
BATTERY CLAMP

Jens Krause, Rahden, and Thomas Heimann, Espelkamp, both of Germany, assignors to Harting Automotive GmbH & Co., KG, Germany

Filed Sep. 15, 2000, Appl. No. 663,279
Claims priority, application Germany, Sep. 22, 1999, 199 45 407
Int. Cl. H01R *4/38*
U.S. Cl. 439—757 **7 Claims**



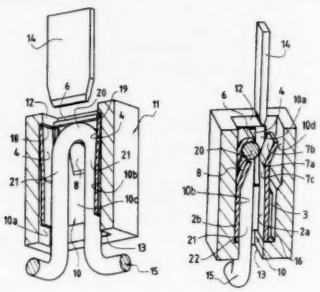
1. A battery clamp comprising a connecting lug (**12**), a contact ring (**10**) which is provided with a slot so as to form two opposite clamping ends (**14**), each clamping end provided with a bent lug (**16**), a slope (**18**) and an arresting edge (**19**), a spring (**22**) which engages the clamping ends of the contact rings, a blocking wedge (**28**) which is positioned between the bent lugs (**16**) of the clamping ends and can be shifted between a mounting position, in which the blocking wedge keeps the clamping ends of the contact ring in a spread condition, and a contact position, in which the blocking wedge releases the clamping ends so that the spring can pull the clamping ends together, and a pivotally mounted covering cap (**24**), the blocking wedge (**28**) being connected with the pivotally mounted covering cap (**24**).

US 6,409,554 B2

ELECTRICAL CONNECTION DEVICE FOR DIRECTLY JOINING A CONDUCTOR TO A MALE ELECTRICAL CONTACT MEMBER

Olivier Verneau, Rueil Malmaison, France, assignor to SYLEA, Montigny le Bretonneus, France

Filed May 29, 2001, Appl. No. 866,983
Claims priority, application France, May 30, 2000, 00 06931
Int. Cl. H01R *4/40*
U.S. Cl. 439—786 **15 Claims**



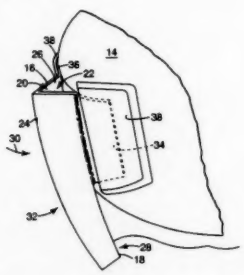
1. An electrical connection device for a male electrical contact member in the form of a tongue, said device including a body in the form of a cage having an internal lateral wall constituting a bearing plate for a bared conductor, wherein said bearing plate has a projection on its inside face, a retaining rim in the vicinity of said projection and a curved elastic wall opposite said bearing plate with its convex side facing toward the interior of said cage, whereby, in use, said conductor can be bent into a U-shape with two branches and a loop, said loop can be inserted between said projection and said rim, and said branches then bear against internal lateral walls adjacent said bearing plate.

US 6,409,555 B1

DEVICE FOR GENERATING A PLUME OF WATER

Thomas M. Plante, Woodbury; Mary S. Slagle, Roseville; Michael J. Nanoff, Bloomington; Valdin C. Omvig, Fairmont; Christopher M. Root, Minneapolis; Mark J. Brandenhoff, Bloomington; Adam Stapleton, Eagan; Daniel P. Longhenry, New Hope, and H. Peter Gardner, Edina, all of Minn., assignors to Rave Sports, Inc., Mounds View, Minn.

Filed Aug. 8, 2000, Appl. No. 634,128
Int. Cl. B63H *11/00*
U.S. Cl. 440—39 **50 Claims**



1. A device for generating a plume of water, said device comprising:

a) a first side wall;

b) a second side wall extending at an angle to said first side wall, said first side wall and said second side wall defining a tapered channel, said channel comprising

i) a first end,

ii) a second end, and

iii) a longitudinal extent extending between said first end and said second end;

c) a first flange extending at an angle to said first side wall; and

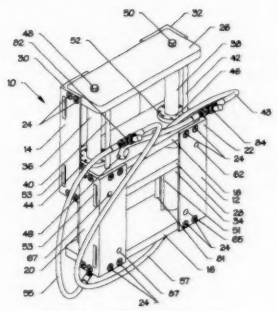
d) a second flange extending at an angle to said second side wall.

US 6,409,556 B1

VARIABLE HEIGHT OUTBOARD MOTOR MOUNT APPARATUS

David Edward Vance, 1260 Ardmore Hwy., Taft, Tenn. 38488

Filed Feb. 5, 2001, Appl. No. 776,972
Int. Cl. B63H *20/08*
U.S. Cl. 440—61 **9 Claims**



1. An apparatus for mounting an outboard motor on a transom of a boat comprising

a first bracket connectable to said transom and having a horizontal upper plate, a spaced-apart horizontal lower plate in alignment with said upper plate and a plurality of first vertical plates connected to said upper plate and said lower plate;

a second bracket connectable to said motor and having a horizontal upper plate, a spaced-apart horizontal lower plate in alignment with said upper plate of said second bracket and a plurality of second vertical plates connected to said upper plate and lower plate of said second bracket;

said first bracket and said second bracket being vertically aligned and slidably connected to one another whereby said second bracket may be raised and lowered with respect to said first bracket;

said upper horizontal plate of said second bracket being disposed above said upper horizontal plate of said first bracket and said lower horizontal plate of said second bracket being disposed between said upper and lower horizontal plates of said first bracket defining a vertically overlapped area therebetween;

a plurality of rods connected to said first and second brackets for prevention of twisting; and

a means for effecting vertical movement of said brackets with respect to one another.

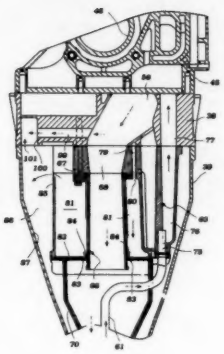
US 6,409,557 B1

EXHAUST ARRANGEMENT FOR OUTBOARD MOTOR

Hiroyuki Tsunekawa, and Takahide Watanabe, both of Shizuoka, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Shizuoka-ken, Japan

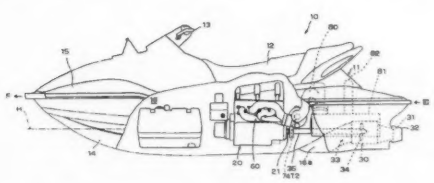
Filed Apr. 30, 1999, Appl. No. 303,066
Claims priority, application Japan, Apr. 30, 1998, 10-119786
Int. Cl. B63H *21/10*
U.S. Cl. 440—88 **71 Claims**

55. An outboard motor comprising a power head and a drive shaft housing depending from the power head, the power head containing a four-cycle, internal combustion engine including at



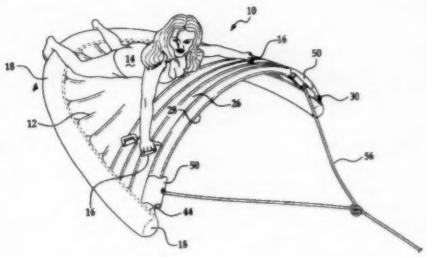
least one coolant passage, a cooling system running coolant through at least one coolant passage, an expansion chamber located in the drive shaft housing, an exhaust pipe depending below the engine and communicating with the expansion chamber to deliver exhaust gases to the expansion chamber, a lubricant tank for the engine disposed in the drive shaft housing above the expansion chamber and in proximity to the exhaust pipe, the lubricant tank being formed with an open area through which the exhaust pipe passes, a collection space formed between at least a portion of the exhaust pipe and a portion of the lubricant tank, a portion of the opening defining a collection space having a lower end positioned lower than a bottom end of the lubricant tank and communicating with the cooling system such that coolant fills at least a portion of the collection space, and an idle exhaust gas pathway communicating with an idle exhaust gas discharge independent of the exhaust pipe, the idle exhaust gas discharge being formed on the drive shaft housing, and an exhaust guide from which the lubricant tank depends, the collection space being defined in part by an upstanding wall that lies to a side of the exhaust pipe and terminates at an upper edge located below the exhaust guide so as to define a spillway between the upper edge of the upstanding wall and a lower side of the exhaust guide.

US 6,409,558 B1
TURBOCHARGED ENGINE STRUCTURE FOR SMALL-SIZED BOAT
Yoshitsugu Gokan; Naoto Hara, and Masatoshi Suzuki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 17, 2000, Appl. No. 714,135
Claims priority, application Japan, Nov. 19, 1999, 11-329461
Int. Cl. B63H *21/32*
U.S. Cl. 440—89 **14 Claims**



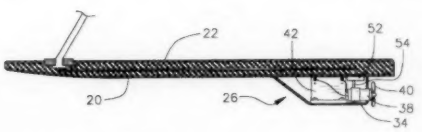
1. A small-sized boat comprising:
an engine having an exhaust manifold;
a crankshaft extending in forward and backward directions of a boat body;
an exhaust gas turbo charger which is driven to rotate by exhaust gas from said exhaust manifold, said exhaust gas turbo charger being provided rearwardly of said exhaust manifold; and
an inter cooler which is connected to a compressor of said exhaust gas turbo charger and disposed below an intake chamber which follows said inter cooler, said inter cooler being provided sidewardly of said engine and said compressor.

US 6,409,559 B2
AQUATIC TOWING DEVICE
Raymond Walsh, 2908 Saturn Dr., Lake Orion, Mich. 48360
Provisional application No. 60/204,976, filed on May 17, 2000.
This application May 15, 2001, Appl. No. 858,204.
Int. Cl. B63B *1/100*
U.S. Cl. 441—66 **9 Claims**



1. A hydraulic device adapted for riding by a person and for towing by a boat, said device comprising:
an elongated buoyant mat having a top surface and a bottom surface, said mat having a front edge and a major axis extending transversely to said front edge, said mat having a curved rear peripheral edge extending between a pair of side edges;
a pair of spaced apart hand holds mounted to said top surface of said mat, said hand holds spaced apart and positioned adjacent said front edge;
a pair of spaced apart towing attachments are mounted to said front edge of said mat, said attachments adopted adapted for connection to a tow line whereby said front edge of said mat forms an arch when said mat is towed by said boat at a predetermined speed.

US 6,409,560 B1
MOTORIZED SURFBOARD DEVICE
Shawn M. Austin, 1828 N. Allen Ave., Pasadena, Calif. 91104
Filed Apr. 12, 2001, Appl. No. 833,430
Int. Cl. B63B *35/79*
U.S. Cl. 441—74 **16 Claims**



1. A motorized surfboard comprising:
a panel having a front edge, a back edge, a pair of side edges, a bottom surface and a top surface, said panel comprising a buoyant material such that said panel floats in water;
a motor housing being attached to said bottom surface of said panel, said motor housing having a distal wall, a proximal wall and a pair of lateral walls with respect to said front edge of said panel, said motor housing being substantially watertight;
a drive motor being positioned in said housing, a propeller being mechanically coupled to said drive motor, said propeller being

positioned between said back edge of said panel and said distal wall of said housing;

a handle being secured to said top surface of said panel, said handle including a bar extending upwardly from said panel, a handgrip being attached to a free end of said bar, said handgrip having a plurality of indentations therein for receiving fingers of a user, a button being positioned on said handle for selectively turning said drive motor on or off, said button being operationally coupled to said drive motor;

a turning means for turning said drive motor, said turning means being operationally coupled to said drive motor; and

a power supply being operationally coupled to said drive motor and positioned in said motor housing.

US 6,409,561 B1

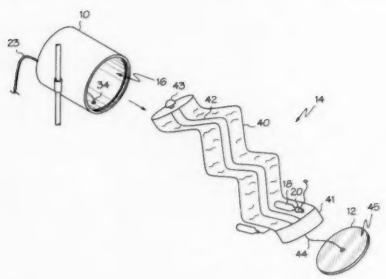
REMOTE ACTIVATED WATER SELF RESCUE SYSTEM

John C. Ibasfalean, Rte. 4 Box 3245, Lake Butler, Fla. 32504

Filed Sep. 29, 2000, Appl. No. 675,766

Int. Cl. B63C *9/04;9/19*

U.S. Cl. 441—93 **13 Claims**



3. A watercraft personal rescue device ensuring reliable deployment comprising:

an inflatable body;

a compressed gas canister containing compressed gas and connected to the inflatable body;

an inflation valve for releasing compressed gas from the gas canister to the inflatable body, the valve having a fuse comprising a fusible material;

means of applying an electrical current through the fuse such that the inflation valve is activated upon applying an electrical current through the fuse; and

a deployment canister having a cavity;

the inflatable body and inflation valve removably retained within the cavity;

a deployment canister cover; the cover removably sealing the cavity;

and wherein:

the inflatable body is of sufficient size and the compressed gas canister contains sufficient gas such that activation of the inflation valve causes the inflatable body to be inflated, thereby forcing the cover from the deployment canister and allowing the inflatable body to exit from the canister.

12. In a rescue device inflation valve having a penetrator for opening a compressed gas canister to allow release of compressed gas into an inflatable rescue, the improvement comprising:

a plunger for causing the penetrator to penetrate the gas canister;

a plurality of resilient retaining elements encircling the plunger;

a fusible element encircling the retaining elements and which is separable upon application of an electrical current through the fusible element; such that separation of the fusible element causes the penetrator to penetrate the gas canister.

US 6,409,562 B1

PLASMA DISPLAY PANEL AND METHOD OF SEPARATING THE SAME

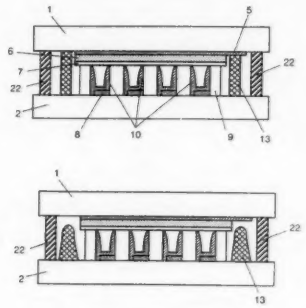
Takahiro Asano, Machida; Narito Shibaike, Setagaya-ku; Yoshio Watanabe, Yokohama, and Tetsuya Kato, Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of application No. 09/407,997, filed on Sep. 29, 1999. This application Jul. 12, 2000, Appl. No. 614,602.

Claims priority, application Japan, Sep. 29, 1998, 10-274953; Oct. 8, 1998, 10-286256

Int. Cl. H01J *9/50*

U.S. Cl. 445—2 **10 Claims**



1. A method of separating a plasma display panel into a front panel and a back panel, comprising:

heating said plasma display panel for softening and expanding a bonding material disposed between said front panel and said back panel, said expanding bonding material generating an expanding force; and

applying said expanding force to at least one of said front panel and said back panel.

US 6,409,563 B1

ELECTRON-EMITTING DEVICE MANUFACTURING METHOD AND APPARATUS, DRIVING METHOD, AND ADJUSTING METHOD

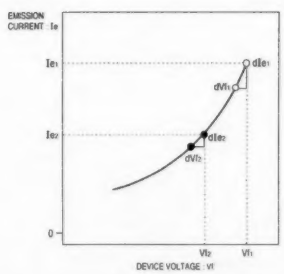
Miki Tamura, Isehara; Keisuke Yamamoto, Yamato, and Yasuhiro Hamamoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 2000, Appl. No. 511,386

Claims priority, application Japan, Feb. 23, 1999, 11-045532; Feb. 21, 2000, 2000-042952

Int. Cl. H01J *9/02*

U.S. Cl. 445—3 **14 Claims**



1. A method of manufacturing an electron-emitting device which has at least two electrodes and emits electrons by applying a voltage between the two electrodes, comprising:

a voltage application step of applying a voltage **V1** between the two electrodes, the voltage **V1** being a voltage having a

relationship with a maximum voltage value V2 applied to the electron-emitting device as a normal driving voltage after said voltage application step, so as to satisfy

giving a current I flowing upon application of a voltage V when the voltage V falling within a voltage range causing electron emission upon application of the voltage between the two electrodes is applied between the two electrodes:

$$I=f(V) \quad (1)$$

and letting f'(V) be a differential coefficient of f(V) at the voltage V,

a first condition:

$$f(V1)/\{V1\cdot f'(V1)-2f(V1)\}>f(V2)/\{V2\cdot f'(V2)-2f(V2)\} \quad (2)$$

wherein said voltage application step satisfies a second condition, upon completion of said voltage application step,

wherein the second condition is defined by letting Xn-1 be a value of a right side of inequality (2) upon a first application of the pulse-like voltage V2 when the voltage V2 is applied as pulses successively twice between the two electrodes upon completion of said voltage application step, and Xn be a value of the right side of inequality (2) upon a second application of the pulse-like voltage V2,

wherein Xn-1 and Xn satisfy:

$$(Xn-1-Xn)/Xn-1\leqq 0.02. \quad (A)$$

US 6,409,564 B1

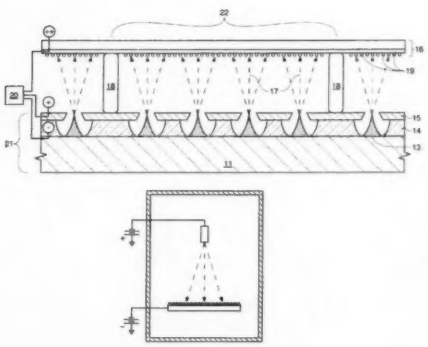
METHOD FOR CLEANING PHOSPHOR SCREENS FOR USE WITH FIELD EMISSION DISPLAYS

Jim J. Browning; Zhongyi Xia; David A. Cathey, all of Boise, and Surjit S. Chadha, Meridian, all of Id., assignors to Micron Technology Inc., Boise, Id.

Filed May 14, 1998, Appl. No. 79,108

Int. Cl. H01J *9/38;9/22*

U.S. Cl. 445—24 **8 Claims**



1. A method of preparing a display screen, comprising:

providing a screen in an evacuated chamber, said screen having at least one phosphor disposed thereon;

exposing said screen to electron energy having a current density greater than 1 mA/cm^2;

baking said screen and said at least one phosphor in atmospheric conditions subsequent to exposure to said electron energy; and

disposing said screen in a display device and sealing said display device subsequent to said baking.

US 6,409,565 B1

REDUCED VOLTAGE FIELD EMISSION CATHODE AND METHOD FOR MANUFACTURING SAME

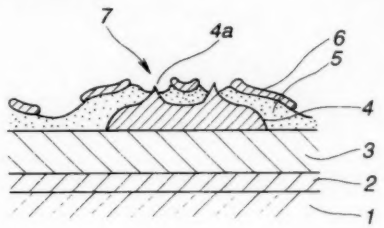
Shigeo Itoh, Mobara; Junji Itoh, and Seigo Kanemaru, both of Tsukuba, all of Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, and Director General Agency of Industrial Science and Technology, Ministry of International Trade & Industry, Tokyo, both of Japan

Filed May 25, 1999, Appl. No. 317,864

Claims priority, application Japan, May 16, 1998, 10-157480

Int. Cl. H01J *9/00*

U.S. Cl. 445—24 **4 Claims**



1. A method for manufacturing a field emission cathode, comprising the steps of:

forming a cathode electrode pattern on a cathode substrate;

forming a photoresist layer;

superposing an intaglio provided with recesses for formation of projections and coated thereon with a release agent on the photoresist layer;

subjecting the photoresist layer to molding under a pressure while being heated, to thereby form the photoresist layer with the projections and modify the photoresist layer;

peeling off the intaglio;

subjecting a surface of the modified photoresist layer to etching;

forming an insulating layer on the modified photoresist layer;

forming a gate electrode pattern on the insulating layer; and

subjecting a lamination between lead-out electrodes on the gate electrode pattern and the insulating layer, to thereby form the lamination with openings;

the projections of the photoresist layer each being exposed at a distal end thereof from a portion of the insulating layer positioned at each of the openings.

US 6,409,566 B1

METHOD OF MANUFACTURING AN ELECTRON SOURCE AND IMAGE FORMING APPARATUS USING THE SAME

Mitsutoshi Hasegawa, Yokohama; Yoshiyuki Osada, Atsugi; Hisaaki Kawade, Yokohama; Yuji Kasanuki, Isehara; Hideshi Kawasaki, Machida, and Yoshimasa Okamura, Odawara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of application No. 09/275,437, filed on Mar. 24, 1999, now Pat. No. 6,313,571, which is a division of application No. 08/906,093, filed on Aug. 5, 1997, now Pat. No. 5,912,531, which is a continuation of application No. 08/223,531, filed on Apr. 5, 1994, now abandoned. This application Sep. 5, 2001, Appl. No. 945,619.

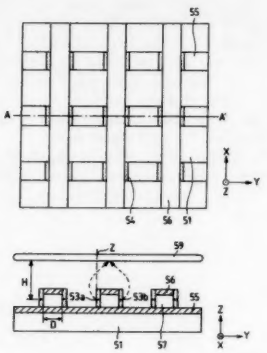
Claims priority, application Japan, Apr. 5, 1993, 5-100127; Apr. 5, 1993, 5-100128; Apr. 5, 1993, 5-100129; Dec. 28, 1993, 5-349133; Mar. 29, 1994, 6-081159

Int. Cl. H01J *9/00;9/24*

U.S. Cl. 445—24 **2 Claims**

1. A method of producing an image forming apparatus comprising the steps of:

(A) providing a first substrate on which an electron source is disposed, the electron source comprising a plurality of row-directional wires, a plurality of column-directional wires



crossing the row-directional wires to form a plurality of intersections, an insulating layer disposed between the row-directional wires and the column-directional wires at each intersection, and a plurality of electron emitting sections disposed on the insulating layers at the intersections and electrically connected to the row-directional wires and the column-directional wires;

(B) providing a second substrate on which an anode is disposed;

(C) arranging a space between the first and second substrates and maintaining the space at a reduced pressure;

(D) connecting a driver for driving the electron source to the row-direction wires and the column-direction wires; and

(E) connecting a direct-current power source to the anode.

US 6,409,567 B1

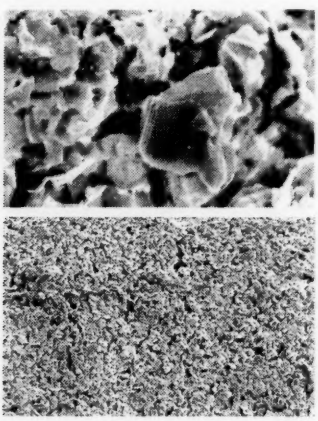
PAST-DEPOSITED CARBON ELECTRON EMITTERS

Daniel Irwin Amey, Jr., Durham, N.C.; Robert Joseph Bouchard; Syed Ismat Ullah Shah, both of Wilmington, Del., and John Gerard Lavin, Swarthmore, Pa., assignors to E.I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application No. PCT/US98/26016, filed on Dec. 8, 1998, Provisional application No. 60/069,453, filed on Dec. 15, 1997. This application Feb. 12, 1999, Appl. No. 250,774.

Int. Cl. H01J *9/04;9/12*

U.S. Cl. 445—50 **37 Claims**



1. A process for producing a field emission electron emitter, which comprises:

(a) forming a layer of composite which comprises graphite particles and glass on a substrate, wherein said glass adheres to said substrate and to portions of said graphite particles thereby affixing said graphite particles to one another and to said substrate and wherein at least 50% of the surface area of said layer of composite consists of portions of said graphite particles; and

(b) bombarding the surface of the layer formed in (a) with an ion beam which comprises ions of argon, neon, krypton or xenon for a time sufficient to form whiskers on said graphite particles.

US 6,409,568 B1

PACKAGED TOY PRODUCT

Irene Søgaard, Vejle, and Tina Thomsen, Århus C, both of Denmark, assignors to Interlego AG, Baar, Switzerland

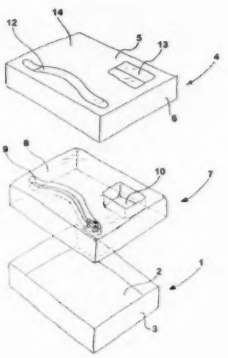
PCT No. PCT/DK99/00544, § 371 Date Jun. 25, 2001, § 102(e) Date Jun. 25, 2001, PCT Pub. No. WO00/21845, PCT Pub. Date Apr. 20, 2000

PCT Filed Oct. 13, 1999, Appl. No. 807,671

Claims priority, application Denmark, Oct. 14, 1998, 1998 01312

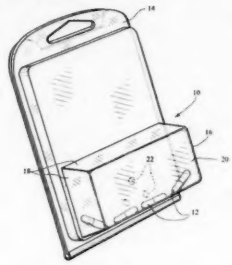
Int. Cl. A63H *3/50*

U.S. Cl. 446—73 **11 Claims**



1. A packaged toy product, said product comprising a number of toy elements with associated packaging, and wherein the associated packaging comprises a box with a bottom face and a top face and a number of lateral faces that extend between the bottom face and the top face, and wherein the top face is configured with at least one transparent opening that allows a viewer to see at least a part of the matter contained in the associated packaging through the transparent opening in the top face, and wherein the associated packaging features at least one compartment in which one or more of the toy elements of the toy product is/are arranged, said compartment being located underneath the transparent opening, whereby the contents of the compartment can be viewed through the transparent opening, characterized in that the compartment is configured as an elongate path, and wherein the path is arranged for at least one toy element, in which the at least one toy element has a height and a width, such that the at least one toy element may be shifted a distance along the path by movement of the packaging, said distance corresponding at least to the largest dimension of the at least one toy element.

US 6,409,569 B1
CONTAINER FOR LIQUID DISSOLVABLE CAPSULES CONTAINING COMPRESSED, EXPANDABLE TOY FIGURES
Stephen D. Boone, 4804 Strawberry La., Louisville, Ky. 40209-1243
Filed Apr. 3, 2001, Appl. No. 825,424
Int. Cl. A63H *3/00*
U.S. Cl. 446—74 **10 Claims**

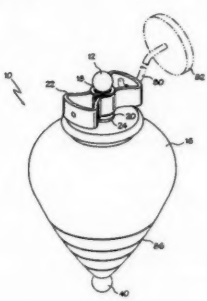


1. In combination with at least one liquid dissolvable capsule containing a compressed, resiliently expandable toy figurine, a container for said, capsule comprising

a flat back plate; and

a receptacle being at least partially transparent for permitting a user to view the interior thereof, said receptacle being attached to and projecting outwardly from said plate, said capsule being confined in a closed hollow chamber formed between said receptacle, and said back plate, said plate defining at least one opening which communicates with said chamber for permitting a quantity of a liquid to flow into said chamber to dissolve said capsule upon immersion of said container in said liquid, said at least one opening having dimensions such that said capsule is prevented from being removed from said chamber therethrough.

US 6,409,570 B1
TETHERED TOP
Robert James Thate, 519 Red Birch Rd., Millersville, Md. 21108
Provisional application No. 60/162,756, filed on Nov. 1, 1999. This application Nov. 1, 2000, Appl. No. 703,401.
Int. Cl. A63H *1/08*
U.S. Cl. 446—262 **16 Claims**



1. A tethered top, comprising:

a top body,

at least one spindle having a spinning tip for surface contact at one end of the spindle,

the spindle mounted coaxially with the top body with the spinning tip extending from the top body,

a low friction housing connector,

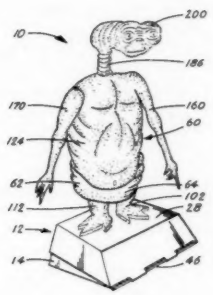
the low friction housing connector connected to the spindle,

a tether having a first and a second end,

the tether connected to the low friction housing connector at the first end, and

the tether wrapped around the top body.

US 6,409,571 B1
MECHANICAL BIPED ASSEMBLY
Carlo Rambaldi, 18409 Bryant St., Northridge, Calif. 91325
Filed Oct. 9, 2001, Appl. No. 972,637
Int. Cl. A63H *3/46; 13/00*
U.S. Cl. 446—330 **20 Claims**



1. A mechanical biped assembly comprising:

a) a base assembly comprising: a lower section; an upper enclosure hingedly attached to said lower section and having an enclosure left leg opening, and a right foot attachment bore; and a spring attached between said lower section and said upper enclosure, wherein the spring maintains said upper enclosure biased in an upward position,

b) a biped body comprising:

(1) a pelvic enclosure having an open upper section and an enclosed lower section having a pelvic left leg opening; a left leg having an upper pelvic opening placed and attached over the pelvic left leg opening, and a left foot having an enclosure opening placed over and attached to the enclosure left leg opening; and a right leg having an upper surface attached to the lower section of said pelvic enclosure and a lower foot attached, by an attachment means, to the right foot attachment bore,

(2) a thorax enclosure comprising an enclosed upper section having a neck opening, an open lower section pivotally attached to the open upper section of said pelvic enclosure, a left section having a left arm opening, and a right section having a right arm opening; a left arm and a right arm having upper ends that are pivotally attached to each respective arm opening; and a neck having a lower edge inserted into the neck opening and an upper edge pivotally attached to a head,

c) a kinematical linkage mechanism that is activated by a single depression of said upper enclosure, said mechanism comprising:

(1) a thorax movement mechanism means that is attached to and causes said thorax enclosure to pivot to the right of a vertical center line that bisects said biped body,

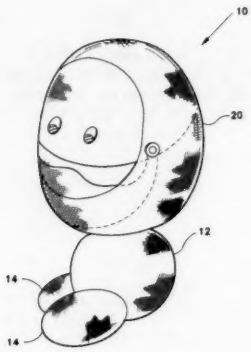
(2) a left-arm movement mechanism means that is attached to and causes said left arm to pivot upward,

(3) a right-arm movement mechanism means that is attached to and causes said right arm to move to the right,

(4) a horizontal neck and head rotation mechanism means that is attached to and causes said neck and head to rotate to the left, and

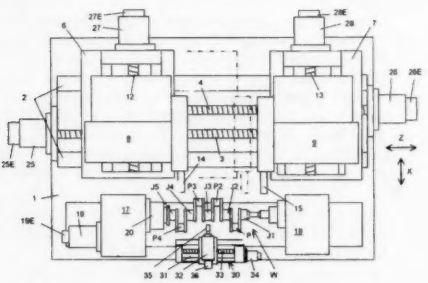
(5) a vertical head rotation mechanism means that is attached to and causrd said head to pivot upward.

US 6,409,572 B1
BIG MOUTH DOLL
Lay Gwon, 25-19 14th Pl., Astoria, N.Y. 11102
Filed Oct. 25, 2001, Appl. No. 983,788
Int. Cl. A63H *3/36*
U.S. Cl. 446—339 **20 Claims**



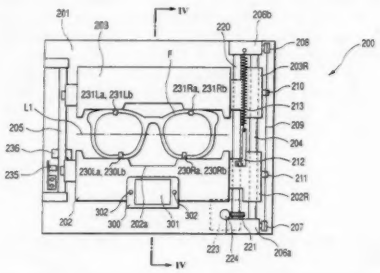
1. A doll with human-like expressions comprising:
a torso having an outer surface, a lower end and an upper end;
a globe-shaped hollow head member mounted on the upper end of said torso, said globe-shaped hollow head member having an open front;
a pair of leg-like members mounted on the lower end of said torso;
a pair of lock/release pivot mechanisms mounted on said head adjacent said open front; and
means mounted in said globe-shaped hollow head member and on said lock/release pivot mechanisms for allowing said doll to assume simulated human-like expressions.

US 6,409,573 B1
COMBINATION GRINDING MACHINE
Ryohei Mukai, Nagoya; Mamoru Katsuta, Kariya; Goro Terahara, Anjo; Tomohiko Yamaguchi, Aichi-ken; Shoichi Sano, Gamagori, and Kazuo Machida, Kariya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Karilya, Japan
Filed Apr. 14, 2000, Appl. No. 550,333
Claims priority, application Japan, Apr. 14, 1999, 11-106182
Int. Cl. B24B *51/00*
U.S. Cl. 451—5 **25 Claims**



1. A combination grinding machine comprising:
a bed;
a workpiece support mechanism disposed on the bed and configured to rotatably support a workpiece having a plurality of axially arranged object portions to be machined;
a first wheel head and a second wheel head disposed on the bed, each configured to be slidable along a common path parallel to an axial direction of the workpiece and in a radial direction perpendicular to the axial direction of the workpiece, the first wheel head and the second wheel head having respective home positions at opposite ends of the common path on the bed;
a grinding wheel supported rotatably on the first wheel head and configured to grind the object portions of the workpiece;
a superfinishing wheel supported rotatably on the second wheel head and configured to superfinish the object portions of the workpiece which have been ground by the grinding wheel;
a first feed unit configured to move the first wheel head in the axial and radial directions;
a second feed unit configured to move the second wheel head in the axial and radial directions; and
a numerical control unit configured to control the first and second feed units to move the first and second wheel heads independently of each other in the axial and radial directions of the workpiece such that the axially arranged object portions are first ground by the grinding wheel and then superfinished by the superfinishing wheel.

US 6,409,574 B1
EYEGLASS-LENS PROCESSING APPARATUS
Ryoji Shibata, Aichi, Japan, assignor to Nidek Co., Ltd., Aichi, Japan
Filed May 1, 2000, Appl. No. 562,809
Claims priority, application Japan, Apr. 30, 1999, 11-125397
Int. Cl. B24B *49/00*
U.S. Cl. 451—5 **14 Claims**



1. An eyeglass-lens processing apparatus for processing a subject lens to be fitted to an eyeglass frame, the apparatus comprising:
a lens chuck shaft for clamping the lens;
rotating means for rotating the lens chuck shaft;
first moving means for moving the lens chuck shaft in a direction of a rotational axis thereof;
second moving means for moving the lens chuck shaft in a direction substantially perpendicular to the rotational axis;
a first feeler having a first contact point to be contacted with a front side refracting surface of the lens;
a second feeler having a second contact point to be contacted with a rear side refracting surface of the lens;
a support member for supporting the first and second feelers so that the first contact point is confronted with the second contact point with a predetermined distance therebetween larger than a thickness of the lens; and
control means for moving the clamped lens using the first moving means so that the clamped lens is contacted with the first contact point and the second contact point consecutively, and controlling each of the rotating means and the second moving means based on processing shape data so as to perform rotation and movement in a state where the first contact point is contacted with the lens, for measurement of a front side refractive surface, and rotation and movement in a state where the second contact point is contacted with the lens, for measurement of a rear side refractive surface.

US 6,409,575 B2

PROCESSING APPARATUS AND METHOD

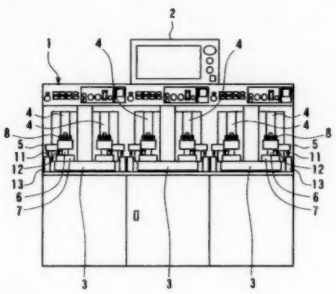
Kazuo Ishizaki; Tatsuo Joji; Yoshifumi Ohtsu, and Hiroyuki Itoh, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 12, 2000, Appl. No. 733,936

Claims priority, application Japan, Jan. 13, 2000, 2000-005052

Int. Cl. B24B *49/00*

U.S. Cl. 451—5 **10 Claims**



1. A processing apparatus comprising:

a processing machine which performs a predetermined process on a workpiece;

a first detector which detects a reference position;

a second detector which detects a position associated with a dimension of the workpiece which changes as a result of the process; and

a controller which recognizes the dimension of the workpiece based on the reference position detected by the first detector and the position detected by the second detector and controls the processing machine such that the dimension of the workpiece becomes a predetermined value.

US 6,409,576 B1

POLISHING APPARATUS

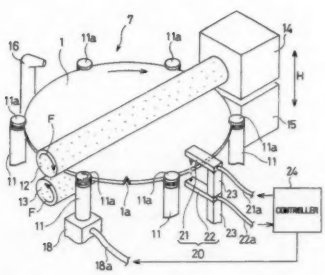
Syozo Oguri, Yokohama; Masafumi Inoue, Fujisawa, and Saburo Takahashi, deceased, late of Fujisawa, all of Japan, by Chishio Takahashi, Mei Takahashi, legal representatives, assignors to Ebara Corporation, Tokyo, Japan

Filed Jul. 26, 2000, Appl. No. 626,124

Claims priority, application Japan, Jul. 26, 1999, 11-211198

Int. Cl. B24B *49/00*

U.S. Cl. 451—6 **7 Claims**



1. A polishing apparatus for polishing a surface of a workpiece, said polishing apparatus comprising:

a polishing section for polishing the surface of the workpiece;

a cleaning section for cleaning the polished surface of the workpiece;

a rotating mechanism provided at said cleaning section, said rotating mechanism for rotating the workpiece during cleaning or after cleaning;

a sensor provided at said cleaning section, said sensor for detecting a reference position of the workpiece;

a controller for controlling said rotating mechanism to stop rotation of the workpiece to align the reference position with a predetermined position based on a detection signal from said sensor; and

a film thickness measuring device for measuring a thickness of a polished surface layer of the aligned workpiece.

US 6,409,577 B1

METHOD FOR CONDITIONING A POLISHING PAD USED IN CHEMICAL-MECHANICAL PLANARIZATION OF SEMICONDUCTOR WAFERS

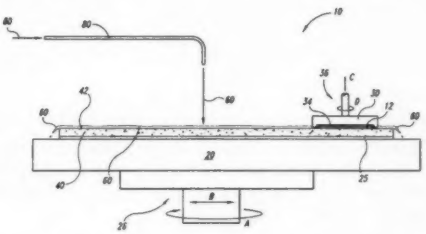
Karl M. Robinson, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of application No. 09/235,224, filed on Jan. 22, 1999, now Pat. No. 6,238,270, which is a continuation of application No. 08/651,109, filed on May 21, 1996, now Pat. No. 5,879,226. This application May 29, 2001, Appl. No. 867,849.

This patent is subject to a terminal disclaimer.

Int. Cl. B24B *1/00*

U.S. Cl. 451—36 **20 Claims**



1. A method for the abrasive planarization of a semiconductor wafer, comprising the steps of:

placing a semiconductor wafer proximate to a polishing pad in the presence of a non-reactive slurry solution, the wafer being held by a wafer carrier;

moving at least one of the wafer or the polishing pad with respect to the other to impart relative motion therebetween, thereby removing material from the wafer and causing waste matter to accumulate on the polishing pad; and

dissolving a desired amount of the waste matter with a selected conditioning solution without mechanically abrading the waste matter from the pad.

US 6,409,578 B1

ADJUSTABLE GRINDING METHOD AND APPARATUS

Frank J. Brian, 3701 Ahern St., Baldwin Park, Calif. 91706

Filed Jul. 31, 2000, Appl. No. 629,752

Int. Cl. B24B *5/40*

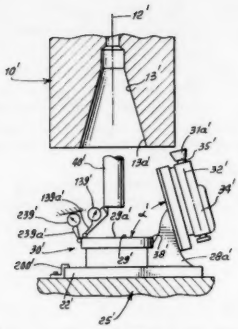
U.S. Cl. 451—51 **12 Claims**

1. An improved method of grinding the bore of a rotary spindle, said bore having a taper, to true said bore while the spindle rotates about a spindle axis, the steps that include:

a) providing a support attachable to a base associated with said spindle,

b) providing an angled slide on said support, the slide being movable endwise relative to said spindle and at a predetermined angle to said axis, said angle corresponding to spindle bore taper,

c) providing a rotary grinder on said angled slide to be movable endwise while the grinder rotates,



d) bodily adjusting said spindle to bring said spindle bore into position to be ground by said grinder as the grinder is moved on said angled slide relative to the bore, and as the spindle rotates,

e) operating said grinder to grind said tapered bore as the spindle is rotated and as said angled slide is moved endwise at said predetermined angle.

US 6,409,579 B1

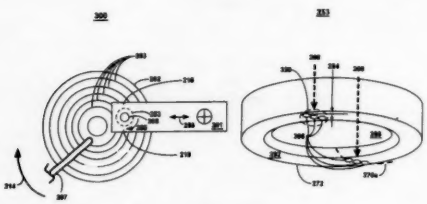
METHOD AND APPARATUS FOR CONDITIONING A POLISH PAD AT THE POINT OF POLISH AND FOR DISPENSING SLURRY AT THE POINT OF POLISH

Nelson W. White, II, Blanco, and Albert H. Liu, San Antonio, both of Tex., assignors to Koninklijke Philips Electronics N.V., Eindhoven, Netherlands

Filed May 31, 2000, Appl. No. 586,551

Int. Cl. B24B *1/00*

U.S. Cl. 451—56 **22 Claims**



1. A method for conditioning and for dispensing polishing slurry on a polish pad of a Chemical Mechanical Polishing (CMP) machine, said method comprising the steps of:

a) receiving polishing slurry at said CMP machine;

b) rotating said polish pad;

c) dispensing said polishing slurry onto a portion of said polish pad located proximately around a location designated for holding a wafer;

d) conditioning said polish pad proximately around a location designated for holding a wafer; and

e) simultaneously performing step c) of dispensing and step d) of conditioning by using interspersed devices on a carrier ring for each step.

US 6,409,580 B1

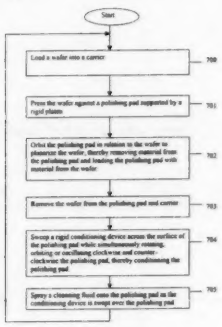
RIGID POLISHING PAD CONDITIONER FOR CHEMICAL MECHANICAL POLISHING TOOL

Wayne Lougher, Phoenix, and Timothy S. Dyer, Tempe, both of Ariz., assignors to SpeedFam-IPEC Corporation, Chandler, Ariz.

Filed Mar. 26, 2001, Appl. No. 817,554

Int. Cl. B24B *1/00*

U.S. Cl. 451—56 **19 Claims**


Start
Load a wafer into a carrier
700
Press the wafer against a polishing pad supported by a rigid platen
701
Orbit the polishing pad in relation to the wafer to planarize the wafer, thereby removing material from the polishing pad and loading the polishing pad with material from the wafer
702
Remove the wafer from the polishing pad and carrier
703
Sweep a rigid conditioning device across the surface of the polishing pad while simultaneously rotating, orbiting or oscillating clockwise and counter-clockwise the polishing pad, thereby conditioning the polishing pad
704
Spray a cleansing fluid onto the polishing pad as the conditioning device is swept over the polishing pad
705

19. A method for conditioning a first and a second polishing pad comprising the steps of:

a) loading a first wafer having a front and back surface into a first carrier;

b) pressing the front surface of the first wafer against a first polishing pad supported by a first rigid platen;

c) orbiting the first polishing pad in order to uniformly remove material from the front surface of the first wafer;

d) during at least part of step c, pressing a rigid conditioning device having an abrasive bottom surface against a second polishing pad supported by a second rigid platen;

e) during at least part of step c, sweeping the conditioning device across the surface of the second polishing pad;

f) during at least part of step c, oscillating the second polishing pad clockwise and counter-clockwise during step e to condition the second polishing pad;

g) removing the first wafer from the first polishing pad;

h) loading a second wafer having a front and back surface into a second carrier;

i) pressing the front surface of the second wafer against the second polishing pad;

j) orbiting the second polishing pad in order to uniformly remove material from the front surface of the second wafer;

k) during at least part of step j, pressing the rigid conditioning device against the surface of the first polishing pad;

l) during at least part of step j, sweeping the conditioning device across the surface of the first polishing pad;

m) during at least part of step j, oscillating the first polishing pad clockwise and counter-clockwise during step l to condition the first polishing pad; and

n) removing the second wafer from the second polishing pad.

US 6,409,581 B1

BELT POLISHING PAD METHOD

Karl M. Robinson, and Michael A. Walker, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of application No. 09/300,007, filed on Apr. 26, 1999, now Pat. No. 6,277,015, which is a division of application No. 09/013,742, filed on Jan. 27, 1998, now Pat. No. 5,990,012. This application Jul. 31, 2000, Appl. No. 629,065.

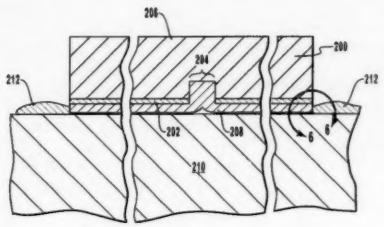
Int. Cl. B24B *1/00*

U.S. Cl. 451—59 **50 Claims**

1. A method of polishing a surface, the method comprising:

providing a belt polishing pad having:

a longitudinal perimeter;



an abrasive material fixed in the polishing pad; and

an external surface including a plurality of non-planar structures, each said structure having a broken linear configuration that is unparallel with respect to the longitudinal perimeter of the belt polishing pad;

wetting a surface on a semiconductor substrate and said belt polishing pad with a polishing solution that chemically enhances the removal of at least a portion of the surface of the semiconductor substrate; and

moving at least one of said belt polishing pad and said semiconductor substrate in mutual contact.

US 6,409,582 B1

POLISHING APPARATUS

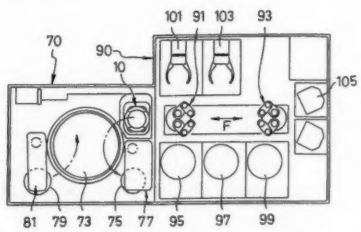
Tetsuji Togawa, Chigasaki; Kuniaki Yamaguchi, Yokohama; Shunichiro Kojima, Fujisawa, and Toyomi Nishi, Yokohama, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Continuation of application No. 08/807,810, filed on Feb. 26, 1997, now Pat. No. 6,050,884. This application Mar. 20, 2000, Appl. No. 531,589.

Claims priority, application Japan, Feb. 28, 1996, 8-69259; Mar. 19, 1996, 8-90567

Int. Cl. B24B *7/22*

U.S. Cl. 451—67 **6 Claims**



1. A polishing apparatus for polishing a surface of a workpiece, said apparatus comprising:

a turntable having thereon a polishing surface;

a top ring for holding a workpiece to be polished and for pressing the workpiece against said polishing surface on said turntable;

a pusher for transferring the workpiece between said top ring and said pusher, said pusher having a workpiece support vertically movable between a transfer position close to said top ring, where transfer of the workpiece occurs, and a withdrawn position, where the workpiece transferred to said support is spaced from and confronts said top ring;

a first cleaning device for ejecting a cleaning liquid toward the workpiece, on said pusher, which has been polished and removed from said top ring, said first cleaning device being operable to clean both surfaces of said workpiece simultaneously;

a second cleaning device for cleaning said workpiece which has been polished and cleaned by said first cleaning device; and

a transfer device for transferring the cleaned workpiece from the second cleaning device to a wafer cassette.

US 6,409,583 B1

APPARATUS FOR POLISHING WAFERS

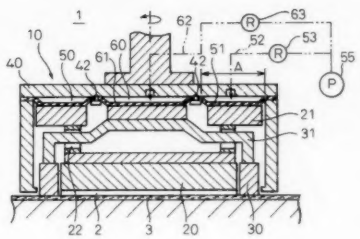
Minoru Numoto, Mitaka, Japan, assignor to Tokyo Seimtsu Co., Ltd., Tokyo, Japan

Filed Mar. 10, 2000, Appl. No. 522,677

Claims priority, application Japan, May 7, 1999, 11-126826

Int. Cl. B24B *7/00*

U.S. Cl. 451—259 **4 Claims**



1. An apparatus for polishing the surface of a wafer by holding the wafer by a holder head and pushing the wafer onto a polishing pad on a rotary polishing table, wherein:

said holder head includes a head body that rotates and is arranged being opposed to said polishing table, a carrier loosely supported by said head body so as to move up and down, and a retainer ring supported by said head body so as to move up and down and is arranged along the outer periphery of said carrier in concentric therewith so as to surround the periphery of the wafer at the time of polishing;

a first pushing means is arranged along the outer periphery under the lower surface of said head body to push said carrier holding the wafer onto said polishing pad; and

a second pushing means is arranged at a central portion under the lower surface of said head body to push said retainer ring onto said polishing pad.

US 6,409,584 B1

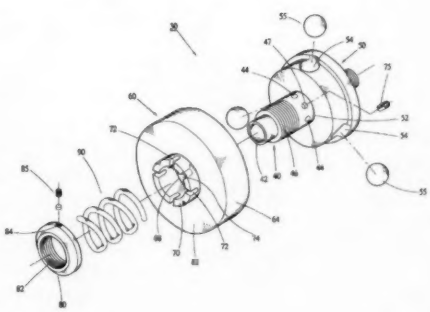
SPEED ADJUSTING DEVICE FOR PNEUMATIC GRINDING TOOL

Freddy Lin, Taichung, Taiwan, assignor to Gison Machinery Co., Ltd., Taiwan

Filed Jul. 24, 2001, Appl. No. 910,861

Int. Cl. B24B *55/00*

U.S. Cl. 451—295 **5 Claims**



1. A speed adjusting device for a pneumatic grinding tool, comprising:

an axle having a passage defined longitudinally in a rear end thereof and a plurality of apertures defined in an outer periph-

ery of the axle at equal intervals, said apertures communicating with said passage, a front end of said axle connected to a rotator;

a base being a circular member and mounted to said axle and rotated with said axle, said base located in front of said apertures, a plurality of paths located in a periphery of said base at equal intervals;

a plurality of slide members respectively and movably received in said slide paths;

a disk having a circular body and a flange extending from a periphery of a front side of said body, said flange having an inclined cone-shaped surface defined in an inner surface thereof, a mount hole defined through a center of said body, a neck extending from a rear side of said body along a periphery of said mount hole, a plurality of air holes defined through said neck at equal intervals, said disk movably mounted on the axle by said mount hole and rotated with said axle, the flange covering the outside of the base, said slide members could contact said cone-shaped surface of said flange, said air holes located in alignment with said apertures;

a spring pushing said disk which is maintained to slide forward and positioned at a normal position;

whereby said air holes located in alignment with said apertures when in normal condition; said air holes located off alignment with said apertures when a rotational speed of said rotator is over speed and the disk is pushed backward by the slide members affected by centrifugal force.

US 6,409,585 B1

POLISHING APPARATUS AND HOLDER FOR HOLDING AN ARTICLE TO BE POLISHED

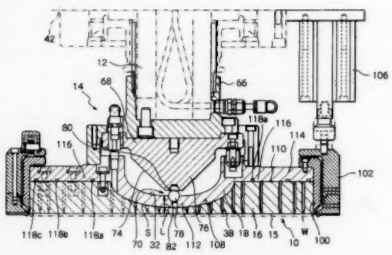
Shin Oowada, Kanagawa-ken, Japan, assignor to Ebara Corporation, Tokyo, Japan

Filed Dec. 21, 1999, Appl. No. 468,307

Claims priority, application Japan, Dec. 21, 1998, 10-363465; Apr. 9, 1999, 11-102613

Int. Cl. B24B *41/06*

U.S. Cl. 451—364 **48 Claims**



1. A substrate holding apparatus comprising:

a substrate holder for holding a substrate to be polished and urging the substrate against a polishing surface, with said substrate holder having an axis for rotation;

a drive shaft for drivingly rotating said substrate holder about said axis for rotation; and

a joint for connecting said substrate holder to said drive shaft in such a manner that said substrate holder can tilt relative to said drive shaft;

wherein said substrate holder includes

(i) a substrate holding member having a lower surface for holding the substrate and an upper surface defining a curved recess, with said upper surface including a bottom portion that defines a bottom of said curved recess; and

(ii) a cover member secured to said substrate holding member, with said cover member having a lower surface with a protrusion extending therefrom which is received within said curved recess, and also having an upper surface having a cavity therein which extends towards said protrusion, with said cavity having a bottom surface through which said axis for rotation vertically extends;

wherein said joint is provided at said bottom surface of said cavity;

wherein said bottom of said curved recess is a central bottom portion and corresponds to a deepest portion of said curved recess; and

wherein said cavity extends into said protrusion such that said bottom surface of said cavity is positioned below the level of said upper surface of said substrate holding member.

US 6,409,586 B2

FIXED ABRASIVE POLISHING PAD

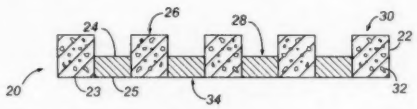
Michael A. Walker, and Karl M. Robinson, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of application No. 08/917,018, filed on Aug. 22, 1997, now Pat. No. 5,919,082. This application Nov. 4, 1998, Appl. No. 187,307.

This patent is subject to a terminal disclaimer.

Int. Cl. B24B *7/00*

U.S. Cl. 451—527 **36 Claims**



1. A polishing pad for polishing a surface, comprising:

a first member defining a first polishing surface and comprising a structurally degradable abrasive first material; and

a surface abrasion impeding second member defining a second surface and comprising a second material, said second material being substantially nondegradable and less abrasive than said first material,

at least a portion of said second member being removable relative to said first polishing surface wherein said first member extends beyond said second member.

US 6,409,587 B1

DUAL-HARDNESS POLISHING PAD FOR LINEAR POLISHER AND METHOD FOR FABRICATION

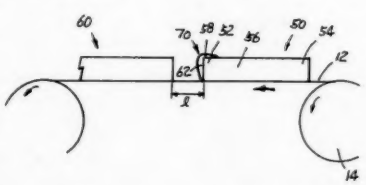
Tsu Shih; Syun-Ming Jang, both of Hsin-Chu; Ying-Ho Chen, Taipei, and Wen-Chih Chiou, Miao-li, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Co., Ltd, Hsin Chu, Taiwan

Filed Nov. 15, 2000, Appl. No. 713,827

Claims priority, application Japan, Nov. 16, 1999, 11-326188

Int. Cl. B24D *11/00*

U.S. Cl. 451—527 **10 Claims**

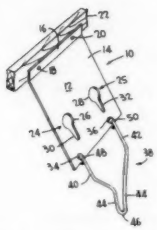


1. A composite polishing pad for linear polishing comprising:

a pad body having a leading edge and a trailing edge for mounting to a linear belt immediately adjacent to a second polishing pad, said pad body being fabricated of a material having a first hardness, said leading edge contacts an object being polished on said composite polishing pad before said trailing edge when said linear belt turns in a linear polishing process; and

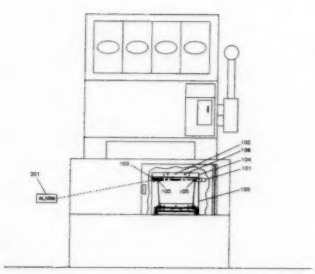
a buffer pad adhesively joined to said leading edge of said pad body for contacting said object that is being polished, said buffer pad being fabricated of a material having a second hardness that is at least 20% smaller than said first hardness such that impact on said object is minimized during a linear polishing process, said buffer pad adhesively joins and covers both a horizontal top surface and a vertical side surface of said leading edge of said pad body.

US 6,409,588 B1
DEVICE FOR SKINNING SQUIRRELS
James H. Womack, 654 Barnes Rd., and Paul K. Womack, 1379 Swartzfairbanks Rd., both of Monroe, La. 71203
Filed Mar. 15, 2001, Appl. No. 808,176
Int. Cl. A22B *1/00*
U.S. Cl. 452—187 **19 Claims**



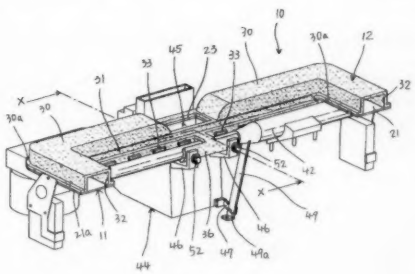
1. A squirrel skinning device comprising:
a rigid base plate having a bottom portion and a forwardly bent top portion; and
a holder with two free ends and a rounded narrowed central portion;
wherein said base plate includes a pair of slots located in the bottom portion with each slot having a wider top portion and tapered lower portion; and a pair of openings located in the bottom portion of the base plate constructed and arranged to receive and removably retain therein the two free ends of said holder.

US 6,409,589 B1
COIN RETRIEVAL SYSTEM
Ramon A. Laconico, Jr., 875 Plaza Dr., San Jose, Calif. 95125, and Joseph L. Trujillo, Los Banos, Calif., assignors to Ramon A. Laconico, Jr., San Jose, Calif.
Provisional application No. 60/136,504, filed on May 28, 1999. This application Apr. 27, 2000, Appl. No. 559,496.
Int. Cl. G07F *9/06*
U.S. Cl. 453—17 **20 Claims**



1. A system for removal of coins from coin operated machines, the system comprising a plurality of collection devices, one device for each machine, each device comprising:
an engagement rod pusher, comprising a base, the base permanently attached to the machine, and at least one rod, the rod being attached to the base and extending out perpendicular to the base; and
a coin drop bucket, the bucket comprising,
a top cover comprising a self-closing seal attached to the top cover, the seal comprising
an enclosure comprising a cylinder which defines an aperture extending vertically through the enclosure,
a shuttle closure comprising a plate, the plate being horizontally disposed within the enclosure,
a plurality of shuttle springs disposed horizontally within the enclosure, each shuttle spring connected at one end to the enclosure and at the other end to the shuttle closure, the shuttle springs being attached such that the plate is aligned to cover the aperture when the springs are relaxed, whereby the shuttle closure can move between a first position where it covers the aperture and a second position where the aperture is not covered,
an end piece attached on the end of the enclosure nearest to the first position of the shuttle, the end piece having an opening for each rod in the rod pusher, whereby when the cover engages the rod pusher, the rods extends through the openings in the end piece, and pushes the shuttle plate away from the aperture, and when the cover is pulled away from the rod pusher the shuttle plate springs back to cover the aperture;
a container section; and
a bottom, the top cover is attached to the top of the container; the bottom is attached to the bottom of the container section;
the engagement rod pusher is located on the machine to engage the self-closing seal on the coin drop bucket when the drop bucket is positioned in the machine.

US 6,409,590 B1
AIR GUIDE DUCT FOR VEHICLE
Hiroshi Suzuki; Kazushi Shikata; Shigeo Numazawa, and Tomohiro Kamiya, all of Aichi, Japan, assignors to Inoac Corporation, and Denso Corporation, both of Aichi, Japan
Filed Nov. 27, 2000, Appl. No. 721,622
Claims priority, application Japan, Nov. 26, 1999, 11-336849; Oct. 11, 2000, 2000-311127
Int. Cl. B60H *1/00*
U.S. Cl. 454—143 **16 Claims**



1. An air guide duct for a vehicle, the air guide duct connected for communicating with an air conditioner unit provided in a cockpit in a vehicle, the air guide duct adapted to pass and guide temperature regulated air supplied from the air conditioner unit, the air guide duct comprising:
a first base body constituting one duct half, the first base body including a mounting part for allowing a wire element of an electrical component system to be contained along the air guide duct; and
a second base body constituting the other duct half, the second base body covered over the first base body to define an air

flowing space therebetween, the second base body including a cover piece which laterally extends from the duct;

wherein the mounting part containing the wire element is covered with the cover piece.

US 6,409,591 B1

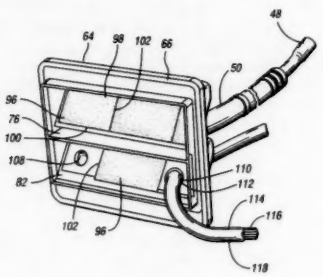
AUTOMOTIVE VEHICLE EXHAUSTER VENT

Thomas M Sullivan, Highland, and Kenneth R Lochner, Allen Park, both of Mich., assignors to DaimlerChrysler Corporation, Auburn Hills, Mich.

Filed Jun. 5, 2001, Appl. No. 874,645

Int. Cl. B60H *1/24*

U.S. Cl. 454—164 **15 Claims**



1. An automotive vehicle comprising:

a car body enclosing a passenger compartment, said passenger compartment providing a first generally sealed control volume, and wherein said car body enclosure has an aperture communicating with an area immediately adjacent an exterior of said car body enclosure;

a ventilation system for inducing into said passenger compartment pressurized air; and

a vent mounted within said car body enclosure aperture, said vent having a check valve for allowing one-way air transfer from said passenger compartment to an area adjacent said car body enclosure exterior and said vent additionally having a sealably mounted sealed conduit to allow a passage through said car body enclosure aperture and vent.

US 6,409,592 B1

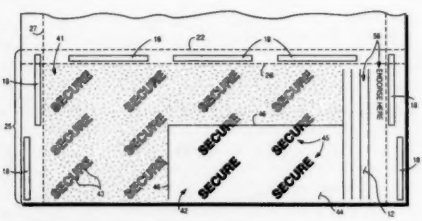
WHITE INK SECURITY FEATURE FOR MAILER TYPE BUSINESS FORMS

Deborah L. McCoy, Lewiston, and David G. Wagner, Amherst, both of N.Y., assignors to Moore North America, Stamford, Conn.

Filed Oct. 20, 1997, Appl. No. 954,156

Int. Cl. B41L *1/26*

U.S. Cl. 462—6 **20 Claims**



1. A business form comprising:

a sheet of paper having first and second areas;

said first area having security indicia positively imaged in white ink thereon; and

said second area substantially covered by white ink with security indicia reverse imaged thereon.

US 6,409,593 B1

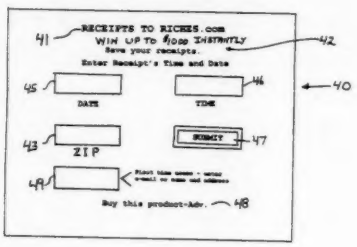
DRAWING FOR WINNERS OVER THE INTERNET

Anthony Petrecca, 142 Washington Ave., Fort Lee, N.J. 07024

Filed Jul. 24, 2000, Appl. No. 624,634

Int. Cl. A63F *9/24*

U.S. Cl. 463—17 **3 Claims**



1. A method of conducting a legal drawing sweepstake over the Internet in which:

(a) a plurality of players obtain a document, each of the documents displaying at least a time and a date;

(b) the players each log onto the Internet and communicate with a server drawing web site;

(c) the drawing web site displays a web page having a box indicating that it is to be filled in with a time and a date;

(d) the drawing web site displays said page also having a box to be filled in with a zip code from the document, when there is no zip code on the document, a zip code is automatically randomly assigned by the web site and said box is automatically filled in; and

(e) the drawing web site randomly selects a time, a date and a portion or all of a zip code and awards a prize to a player whose time, date and zip code most closely matches the selected time, date and zip code.

US 6,409,594 B1

SYSTEM AND APPARATUS FOR PLACING AND CONTROLLING A WAGER ON A GAMING DEVICE

Paul E. Rubeli, Paradise Valley, Ariz., assignor to Aztar Corporation, Phoenix, Ariz.

Filed Jul. 27, 1999, Appl. No. 361,858

Int. Cl. A63F *9/00*

U.S. Cl. 463—20 **12 Claims**

Coins Bet	Prior Art (10 Coin Game)	Enhanced Payout Schedule
1	400	400
2	800	800
3	1200	1200
4	1600	1600
5	2000	4000
6	2400	4400
7	2800	4800
8	3200	5200
9	3600	5600
10	8000	8000
20		16000

1. A method for controlling a wager while playing a game of chance including:

inputting a representative value into a value entry device, wherein depositing the representative value creates a maximum credit limit for a player; and

determining a wager amount, wherein the player controls the wager amount by selecting a combination of wager selection

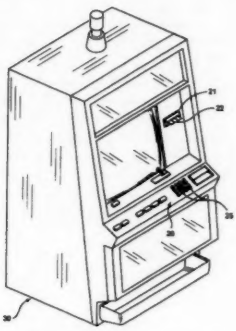
devices, wherein each wager selection device is associated with a predetermined amount.

US 6,409,595 B1

LIGHTED KEYPAD ASSEMBLY AND METHOD FOR A PLAYER TRACKING SYSTEM

Mark Uihlein, Henderson; Robert H. Carson, Jr., Sparks, and Tracy Powell, Reno, all of Nev., assignors to International Game Technology, Reno, Nev.

Filed Oct. 29, 1999, Appl. No. 430,242
Int. Cl. G06F *17/00*
U.S. Cl. 463—29 **55 Claims**



1. A keypad assembly for use with a card reader configured to read a player identification card therein, said keypad assembly comprising:

a keypad mechanism having a plurality of keys to input data, said keys being translucent for back lighting thereof;

a card reader feedback mechanism coupled to the keypad mechanism, said feedback mechanism including a plurality of illumination devices for selective illumination a respective key thereof; and

a validation device coupled to the feedback mechanism, and adapted to determine the validation of information relating to the identification card upon cooperation thereof with the card reader, said validation device further being operably, coupled to the illumination devices for collective illumination of the keys in a first lighting mode to visually inform the Player that the information relating to the identification card has been validated, and a second lighting mode to visually inform the Player that the information relating to the identification card has not been validated.

US 6,409,596 B1

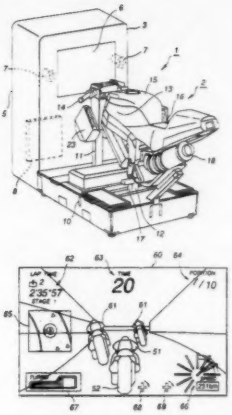
GAME DEVICE AND IMAGE DISPLAYING METHOD WHICH DISPLAYS A GAME PROCEEDING IN VIRTUAL SPACE, AND COMPUTER-READABLE RECORDING MEDIUM

Yasuhiro Hayashida; Atsushi Ueno, and Taishi Yasuda, all of Tokyo, Japan, assignors to Kabushiki Kaisha Sega Enterprises, Tokyo, Japan

Filed Sep. 10, 1998, Appl. No. 150,595
Claims priority, application Japan, Sep. 12, 1997, 9-248081
Int. Cl. A63F *13/00*
U.S. Cl. 463—31 **15 Claims**

1. A game device which displays on a monitor screen a picture of a game being proceeded in a virtual space by a first object controlled by a player and a second object controlled by a computer or an opponent, comprising:

a support screen forming circuit for forming in said monitor screen a small screen displaying information which supports the control of said first object;



a display mode alteration distinguishing circuit for distinguishing whether or not a condition falls under a prescribed condition to alter the display magnification of said small screen during the game progress in said virtual space; and

a display magnification setting circuit for setting the display magnification of information in said small screen pursuant to a distinction result of said distinguishing circuit;

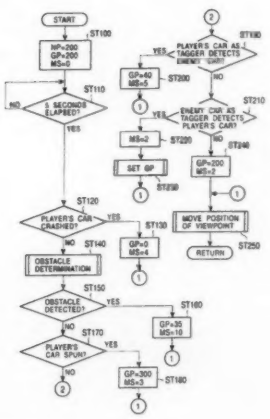
wherein said prescribed condition is a distance between said first object and said second object exceeding a reference value.

US 6,409,597 B1

VIDEO GAME MACHINE, SCREEN DISPLAY METHOD FOR VIDEO GAME, AND RECORDING MEDIUM CONTAINING SCREEN DISPLAY PROGRAM

Toru Mizumoto, Kobe, Japan, assignor to Konami Co., Ltd., Kobe, Japan

Filed Jan. 25, 1999, Appl. No. 237,271
Claims priority, application Japan, Jan. 28, 1998, 10-016203
Int. Cl. A63F *13/00*
U.S. Cl. 463—31 **52 Claims**



1. A video game machine comprising:

operation means for outputting an operation signal when said operation means is externally operated, said operation signal corresponding to a type of operation;

motion-control means for moving a game character in a game space in accordance with said operation signal;

rendering means for displaying, on a displaying means, an image including said game character using a predetermined position set with respect to said game character as a viewpoint;

condition storage means for storing viewpoint conditions and corresponding selected predetermined positions relative said game character for use as said predetermined position, wherein said viewpoint conditions are dynamic conditions of said game character based on movement of said game character in response to said operation signal during continuous execution of gaming;

condition determination means for determining whether ones of said viewpoint conditions are satisfied; and

viewpoint-position control means for moving the viewpoint to from a present predetermined position to one of the selected predetermined positions corresponding to one of said viewpoint conditions at one of predetermined viewpoint moving speeds associated with said one of said viewpoint conditions when said one of said viewpoint conditions is satisfied.

US 6,409,598 B1

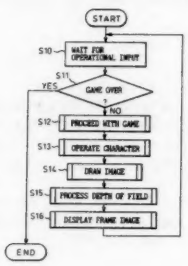
METHOD, PROGRAM PRODUCT, AND GAME SYSTEM FOR BLURRING AN IMAGE

Hisahiko Takeuchi, Tokyo, Japan, assignor to Square Co., Ltd., and Dream Factory Co., Ltd., both of Tokyo, Japan

Filed Apr. 28, 2000, Appl. No. 559,126

Int. Cl. A63F *9/24*

U.S. Cl. 463—31 **18 Claims**



1. A method for blurring a scene of a game, the method including:

setting a depth from any perspective point for a scene in a virtual space,

setting a blurring degree higher the deeper the set depth, the blurring degree being uniform up to a predetermined distance from said perspective point and increasing in steps behind said predetermined distance,

executing blurring processing on said scene based on the set blurring degree, and

displaying the scene obtained by the executed blurring processing.

US 6,409,599 B1

INTERACTIVE VIRTUAL REALITY PERFORMANCE THEATER ENTERTAINMENT SYSTEM

Randy T. Sprout, and Susan M. Sprout, both of Wildwood, Mo., assignors to Ham on Rye Technologies, Inc., Wildwood, Mo.

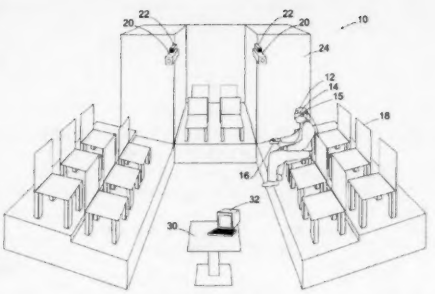
Provisional application No. 60/144,492, filed on Jul. 19, 1999. This application Jul. 17, 2000, Appl. No. 617,388.

Int. Cl. A63F *13/00*

U.S. Cl. 463—31 **9 Claims**

1. A system which interacts with participants and performers, said system comprising:

an immersive virtual reality environment;



at least one performer input device, in electronic communication with said immersive virtual reality environment;

at least one participant input device in electronic communication with said immersive virtual reality environment;

at least one performer output device in electronic communication with said immersive virtual reality environment;

at least one participant output device in electronic communication with said immersive virtual reality environment;

wherein at least one live performer interacts with at least one participant and said immersive virtual reality environment;

wherein said immersive virtual reality environment includes a live or prerecorded video image of said at least one live performer and audio communication between said at least one live performer and said at least one participant, or between said at least one participant and said at least one live performer, or both;

wherein said at least one participant interacts with said at least one live performer and said immersive virtual reality environment, thereby resulting in an experience which is in part controlled by said at least one participant and said at least one participant input device.

US 6,409,600 B1

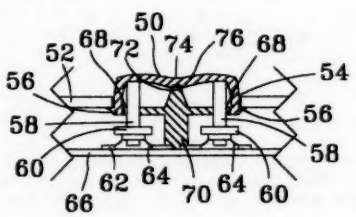
GAME CONTROLLERS KEYS

John Sobota; Kip Hampson, and Hee-Jong (Andy) Yu, all of Edmonton, Canada, assignors to Eleven Engineering Inc., Edmonton

Filed May 13, 1999, Appl. No. 311,393

Int. Cl. A63F *13/02*

U.S. Cl. 463—37 **3 Claims**



1. A game controller comprising:

a housing having an aperture through at least one portion of said housing;

a printed circuit board within said housing;

a switch proximate to said printed circuit board for selectively operating said printed circuit board;

a key insertable through said housing aperture for engagement with said housing, wherein said key is moveable relative within a selected movement range relative to said housing;

at least one plunger positioned between said key and said switch for translating movement of said key to said switch;

a plunger guide for controlling movement of said plunger; and

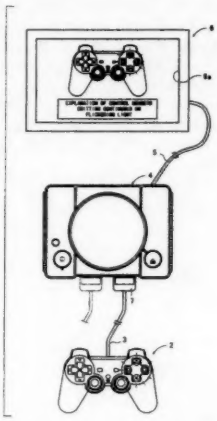
a pivot for limiting movement of said key toward said switch.

US 6,409,601 B2

ENTERTAINMENT SYSTEM AND SUPPLY MEDIUM

Hiroki Ogata; Shigehisa Miyasaka, and Nobuhiro Komata, all of Tokyo, Japan, assignors to Sony Computer Entertainment Inc., Japan

Filed Jul. 26, 1999, Appl. No. 361,439
Claims priority, application Japan, Jul. 31, 1998, 10-218292
Int. Cl. A63F *13/02*
U.S. Cl. 463—37 **20 Claims**



1. An entertainment system, comprising:

a manual control input device for entering control commands, said manual control input device having a plurality of control members;

a display monitor for displaying an image of said manual control input device;

a video game machine for generating an image of a game character to be displayed on said display monitor; and

a controller responsive to a signal sent from said video game machine to said manual control input device and to emission of continuous or flickering light from one or more of said control members in said displayed image of said manual control input device, for energizing a corresponding one or more of said control members of said manual control input device to emit continuous or flickering light in synchronization with said emission of continuous or flickering light from said displayed image.

US 6,409,602 B1

SLIM TERMINAL GAMING SYSTEM

Michael S. Wiltshire; James J. Lisenbee, both of Reno, Nev.; Jayant S. Karmarkar, Aptos, Calif., and Timothy A. Wiltshire, Reno, Nev., assignors to New Millenium Gaming Limited, Reno, Nev.

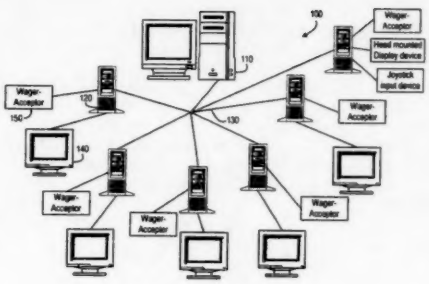
Continuation-in-part of application No. 09/187,135, filed on Nov. 6, 1998, now abandoned. This application Nov. 24, 1998, Appl. No. 199,529.
Int. Cl. A63F *13/00*
U.S. Cl. 463—42 **29 Claims**

1. A computer gaming system comprising:

one or more server/host computers;

one or more client/terminal computers for connection to the server/host computers via communication pathways;

one or more computer gaming programs executed on at least one server/host computer but not on any of the client/terminal computers;



a server/host interface program executed on each server/host computer; and

a client/terminal program executed on each client/terminal computer;

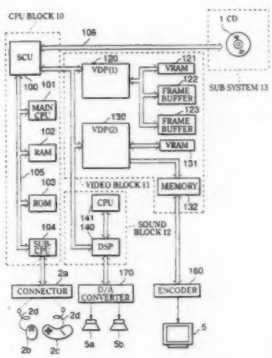
wherein the computer gaming program executed on the server/host computer separates input and output streams at an application layer of a protocol stack, and redirects the input and output streams over the communication pathways to the client/terminal computers via the server/host interface program and the client/terminal program.

US 6,409,603 B1

GAME DEVICE, GAME PROCESSING METHOD, AND RECORDING MEDIUM

Akira Nishino; Toru Ohara; Shuntaro Tanaka, and Yuichi Matsuoka, all of Tokyo, Japan, assignors to Kabushiki Kaisha Sega Enterprises, Tokyo, Japan

PCT No. PCT/JP98/01912, § 371 Date Dec. 22, 1998, § 102(e) Date Dec. 22, 1998, PCT Pub. No. WO98/47588, PCT Pub. Date Oct. 29, 1998
PCT Filed Apr. 24, 1998, Appl. No. 202,788
Claims priority, application Japan, Apr. 24, 1997, 9/107704
Int. Cl. A63F *9/24*
U.S. Cl. 463—43 **17 Claims**



1. A game apparatus requiring certain operations of a player within a time limit comprising:

means for displaying one window for a period of time within a first time limit;

means for displaying a second window separately from said first window for a period of time within a second time limit and

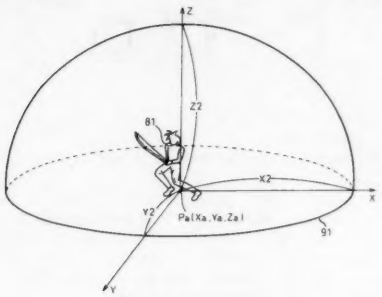
means for displaying at least once said first window during the display of the second window.

US 6,409,604 B1

COMPUTER READABLE PROGRAM PRODUCT, METHOD OF CONTROLLING DISPLAY OF GAME AND GAME SYSTEM

Yasumi Matsuno, Tokyo, Japan, assignor to Square Co., Ltd., Tokyo, Japan

Filed Mar. 29, 2000, Appl. No. 537,179
Claims priority, application Japan, Jun. 30, 1999, 11-185575
This patent is subject to a terminal disclaimer.
Int. Cl. A63F *13/00*
U.S. Cl. 463—43 **28 Claims**



1. A computer readable recording medium on which is recorded a game program for causing a computer to:

set an effective range of an attack on a target object, positioned in an attack area set in a virtual space in response to a first player operation, based on a position of a player character when said attack is instructed;

display three-dimensionally the set effective range of attack as the attack area; and

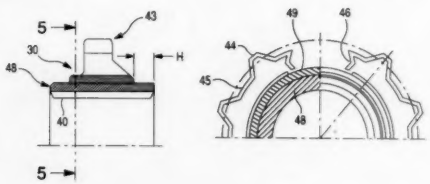
launch the player character's attack on the displayed attack area in response to a second player operation.

US 6,409,605 B1

HUB FOR PRELIMINARY SHOCK ABSORBER IN PARTICULAR FOR MOTOR VEHICLE, AND TORQUE DAMPING DEVICE COMPRISING SAME

Bruno Hemeryck, Belleuse, France, assignor to Valeo, Paris, France

PCT No. PCT/FR98/00281, § 371 Date May 27, 1999, § 102(e) Date May 27, 1999, PCT Pub. No. WO98/36188, PCT Pub. Date Aug. 20, 1998
PCT Filed Feb. 14, 1997, Appl. No. 171,168
Claims priority, application France, Feb. 14, 1997, 97 01857
Int. Cl. F16D *47/02;3/12*
U.S. Cl. 464—68 **16 Claims**



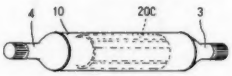
1. A hub for a predamper of a damping device having loose coupling means (**60**), especially for a motor vehicle, comprising two distinct and concentric coaxial parts (**43**, **48**) namely externally an external flange (**43**) having a denture consisting of teeth (**44**) and recesses (**45**) of the loose coupling means (**60**) and internally an internal piece (**48**) being longer than the external flange (**43**) and internal rotary coupling splines (**40**) for coupling the hub (**30**) in rotation with a shaft, characterized in that the internal piece is an internal sleeve (**48**) having the internal rotary coupling splines (**40**), in that the flange (**43**) has a tubular form (**49**) at its inner periphery said tubular inner periphery (**49**) of the external flange (**43**) has a greater axial length than the remainder of the external sleeve (**43**), to define shoulders (**71**, **72**) in the region of said denture (**44**, **45**), and in that the inner periphery (**49**) of the external flange (**43**) is fitted around the outer periphery of the internal sleeve (**48**), with axial stop means being interposed for preventing any axial sliding movement of the external flange (**43**) with respect to the internal sleeve (**48**).

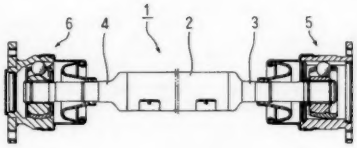
US 6,409,606 B1

POWER TRANSMISSION SHAFT

Tatsuo Nakajima, Iwata; Hitoshi Kodama, and Tsuneo Takano, both of Toyohashi, all of Japan, assignors to NTN Corporation, Osaka, and Mitsubishi Rayon Kabushiki Kaisha, Tokyo, both of Japan

Filed Jul. 27, 2000, Appl. No. 627,157
Claims priority, application Japan, Aug. 5, 1999, 11-222982
Int. Cl. F16L *9/14;* **F16C** *3/00*
U.S. Cl. 464—181 **17 Claims**





1. A power transmission shaft comprising metal joint elements and a metal pipe connected to each other,

wherein a fiber reinforced plastic pipe is inserted into the metal pipe,

wherein the fiber reinforced plastic pipe is provided with a slit of not less than 0.01% and not greater than 40% of an outer circumference thereof in width in a natural state, and

wherein said slit has a bias angle within +/−30 degrees with respect to an axial direction of the fiber reinforced plastic pipe.

US 6,409,607 B1

GOLF COURSES AND METHODS OF PLAYING GOLF

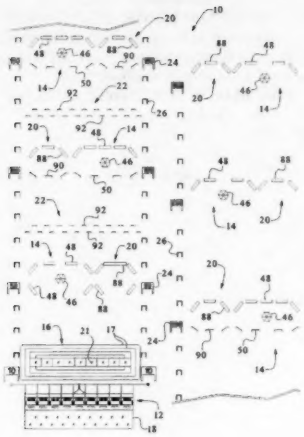
Jeffrey M. Libit, 13244 Circulo Largo Ct., NE., Albuquerque, N. Mex. 87112, and Sidney Libit, 2525 Gulf of Mexico Dr., Suite 12D, Longboat Key, Fla. 34228

Filed Apr. 20, 1999, Appl. No. 295,253
Int. Cl. A63B *69/36*
U.S. Cl. 473—170 **43 Claims**

1. A golf course comprising:

a golf ball hitting area used for a plurality of golf holes;

a plurality of target greens spaced at various distances from the golf ball hitting area, at least one target green having a center pin section separated from a plurality of modular outer perimeter sections by ground terrain, the at least one target green having an outermost boundary defined by the plurality of modular outer perimeter sections, the modular outer perimeter sections being individual sections supported independently of each other;



a target chipping area adjacent the golf ball hitting area; and

a putting green adjacent the golf ball hitting area.

US 6,409,608 B1

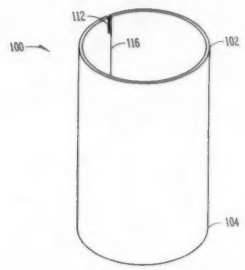
GOLF CUP SLEEVE

Stephen J. Garske, Little Canada, Minn., assignor to Par Aide Products Co., St. Paul, Minn.

Filed Aug. 6, 1999, Appl. No. 369,529

Int. Cl. A63B *57/00*

U.S. Cl. 473—175 **13 Claims**



1. A golf cup apparatus comprising:

a golf cup comprising a cylinder extending from a top surface to a bottom surface, the golf cup including a wall extending between the top surface and the bottom surface, the cup wall defined by an interior surface and an exterior surface;

a cup sleeve disposed within the golf cup, the sleeve comprising a cylinder having an open circular top end and an open circular bottom end and the cup sleeve abutting the interior surface of the golf cup without interfering with a golf ball dropping within the golf cup; and the sleeve includes a line of weakness; and

wherein the cup sleeve extends from a first end to a second end and the line of weakness extends from the first end to the second end of the cup sleeve.

US 6,409,609 B1

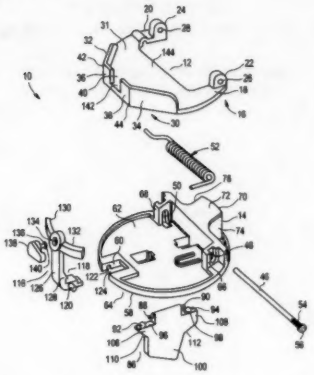
GOLF BALL EJECTOR

Richard F. Brezic, Bratenahl, Ohio, assignor to McDivot Novelties, Inc., Cleveland, Ohio

Filed Sep. 11, 2000, Appl. No. 659,514

Int. Cl. A63B *57/00*

U.S. Cl. 473—177 **44 Claims**



1. A novelty golf ball ejector for ejecting a golf ball from a golf course cup with a cylindrical side wall, a top opening and a bottom portion with a centered hole, said golf ball ejector comprising: a base plate having a top surface for guiding the golf ball onto an ejector plate, said ejector plate being pivotally interengaged with said base plate for ejecting the golf ball out of the top opening of the cup when the golf ball is in an ejection position on said ejector plate, said golf ball ejector further comprising means for actuating said ejector plate when the golf ball is in said position.

US 6,409,610 B1

GOLF PUTTER HAVING IMPROVED MARKING

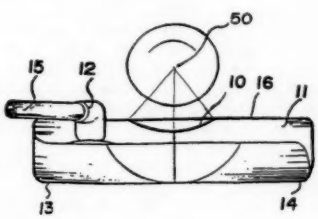
Stephen C. Ahn, 8809 Southlea Ct., Fairfax, Va. 22031, and Suh Yong Lee, 4118 Amesbury La., Durham, N.C. 27707

Continuation-in-part of application No. 09/114,523, filed on Jul. 13, 1998, now Pat. No. 6,045,452. This application Mar. 7, 2000, Appl. No. 520,159.

This patent is subject to a terminal disclaimer.

Int. Cl. A63B *53/04;69/36*

U.S. Cl. 473—249 **5 Claims**



1. A golf putter comprising:

a putter head, a hosel attached to the putter head, a shaft receiver on the hosel for receiving a shaft, the putter head having a heel portion at one end and a toe portion at the other end, a striking face, and a contoured top surface;

a marking formed on said contoured top surface, said marking having a straight line portion and a curved portion, said curved portion having a radius of curvature which is equivalent to a radius of curvature of a circle having a radius extending from an approximate center point of a regulation size golf ball to a point where said straight line portion bisects

said curved portion of said marking when a golf ball is abutting said striking face.

US 6,409,611 B1

GOLF SWING TRAINING UMBRELLA AND GOLF BALL RETRIEVING DEVICE

Richard Louk, Jr., 260 E. Clearview Ave., Worthington, Ohio 43085

Filed Sep. 28, 2000, Appl. No. 671,896
Int. Cl. A63B *57/00;* **A45B** *3/00*
U.S. Cl. 473—286 **10 Claims**

1. A golf swing training umbrella and golf ball retrieving device comprising:

a support assembly having a base member and a plurality of tubular sections telescopically disposed in said base member and having an innermost tubular section and an outermost tubular section;

a cover support assembly being collapsibly attached to a first end of said base member;

a cover member being securely supported upon said cover support assembly;

a hand-grip member being securely and removably disposed about said support assembly;

a golf ball retrieval assembly being securely and removably attached to an end of said outermost tubular section, said retrieval assembly including a bracket member having a first end portion being attached to said end of said outermost tubular section of said support assembly, said bracket member having threads disposed upon an outer surface thereof;

said retrieval assembly including a bracket fastening member being attached to said base member and being threadably couplable to said bracket member such that each of said tubular sections is restricted from extending away from said base member, said bracket fastening member comprising an annular member having a threaded internal wall for selectively coupling to said outer surface of said bracket member;

said base member including an annular flange being disposed upon and extending thereabout an open second end of said base member; and

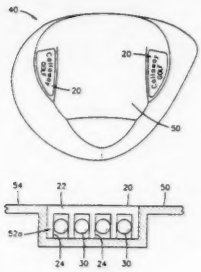
said bracket fastening member having an annular groove disposed therein for receiving said annular flange of said base member, wherein said bracket fastening member is permitted to rotate freely about said second end of said base member such that said bracket fastening member and said bracket member are selectively couplable when said bracket fastening member is rotated.

US 6,409,612 B1

WEIGHTING MEMBER FOR A GOLF CLUB HEAD

D. Clayton Evans, San Marcos; Donald A. Bistline, Vista, and Victor S. Dennis, Rancho Santa Fe, all of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

Filed May 23, 2000, Appl. No. 578,788
Int. Cl. A63B *53/04;53/06;53/08*
U.S. Cl. 473—324 **9 Claims**



1. A wood-type golf club head having a weighting device comprising:

a striking plate, a crown, a toe end, a heel end, and a sole;

the sole having a plurality of indentations wherein a plurality of weighting devices are placed;

each of the plurality of weighting devices having a polyurethane body composed of a first material having a density in the range of 0.90 grams per cubic centimeter to 1.00 grams per cubic centimeter, each body having a plurality of ports; and

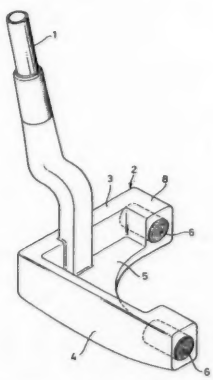
a plurality of high density members, each of the plurality of high density members having a density of at least 5 grams per cubic centimeter and being disposed within a corresponding port of the plurality of ports.

US 6,409,613 B1

L-SHAPED PUTTER

Shozaburo Sato, 1-1-19, Hanjo, Mino, Japan, 562-0044

Filed Feb. 14, 2001, Appl. No. 782,038
Int. Cl. A63B *53/04*
U.S. Cl. 473—337 **7 Claims**



1. A golf putter comprising:

a shaft; and

a head attached to an end of said shaft, said head including:

a face part having a ball-striking face, a toe-side end, and a heel-side end, said shaft being connected to said face part of said head;

a sidewall extending from said heel-side end of said face part in a rearward direction with respect to said ball-striking face;

a first weight located at said toe-side end of said face part; and

a second weight located at a rear end of said sidewall such that said second weight is located a greater distance behind said ball-striking face than said first weight.

US 6,409,614 B1

MULTI-LAYER GOLF BALL AND METHOD OF MAKING SAME

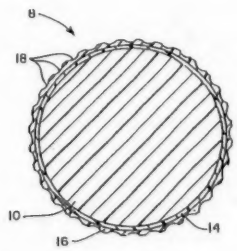
Mark L. Binette, Ludlow; David M. Melanson, and Michael John Tzivanis, both of Chicopee, all of Mass., assignors to Spalding Sports Worldwide, Inc., Chicopee, Mass.

Continuation-in-part of application No. 08/877,937, filed on Jun. 18, 1997, which is a continuation-in-part of application No. 08/490,963, filed on Jun. 15, 1995, now Pat. No. 6,042,488, Provisional application No. 60/217,934, filed on Jul. 13, 2000. This application Oct. 2, 2000, Appl. No. 677,409.

This patent is subject to a terminal disclaimer.

Int. Cl. A63B *37/00;37/04;37/06*

U.S. Cl. 473—371 **19 Claims**



1. A golf ball comprising:

a core comprising one or more high Mooney viscosity polybutadiene rubbers,

an inner cover layer comprising one or more high flow ionomers and having a Shore D hardness of about 65 or less, and

an outer cover layer comprising an ionomer, the outer cover layer being harder than the inner cover layer and having a Shore D hardness of at least about 60,

the sum of the thickness of the inner cover layer and the thickness of the outer cover layer being at least 0.090 inches.

US 6,409,615 B1

GOLF BALL WITH NON-CIRCULAR SHAPED DIMPLES

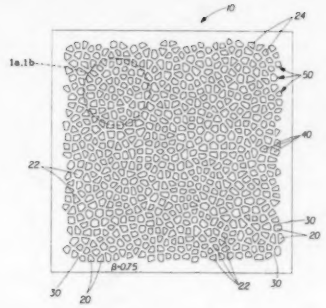
Kenneth Stephen McGuire, Wyoming; Richard Tweddell, III, and Peter Worthington Hamilton, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of application No. 09/639,362, filed on Aug. 15, 2000, now abandoned, and a continuation-in-part of application No. 09/654,573, filed on Sep. 1, 2000. This application Sep. 15, 2000, Appl. No. 662,861.

Int. Cl. A63B *37/14;37/12*

U.S. Cl. 473—383 **21 Claims**

1. A golf ball having a surface comprising a plurality of non-



circular dimples arranged in an amorphous pattern on said surface and spaced by land portions having substantially uniform widths.

US 6,409,616 B1

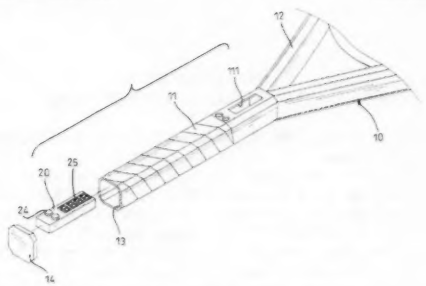
CALORIE COUNTING RACKET

Wen-Sen Lin, Taichung, Taiwan, assignor to Topteam Technology Taiwan Co., Ltd., Taichung, Taiwan

Filed May 16, 2001, Appl. No. 855,495

Int. Cl. A63B *69/38*

U.S. Cl. 473—553 **10 Claims**



1. A calorie counting racket comprising:

a skeleton (**10**) having a grip (**11**) and a frame (**12**); and

a counter unit (**20**) securable inside the grip (**11**) of the skeleton (**10**);

wherein the counter unit (**20**) comprising

a microprocessor (**21**);

a frequency counter (**22**) electrically communicating with the microprocessor (**21**) and inputting quantities of swings of the racket to the microprocessor (**21**);

a force estimating unit (**23**) electrically communicating with the microprocessor (**21**) and inputting acceleration of the racket to the microprocessor (**21**);

press buttons (**24**) electrically communicating with the microprocessor (**21**) and to refresh data of the microprocessor (**21**); and

a display (**25**) electrically communicating with the microprocessor (**21**) to display information from the microprocessor (**21**).

US 6,409,617 B1

HUNTING ARROW TRACKING SYSTEM

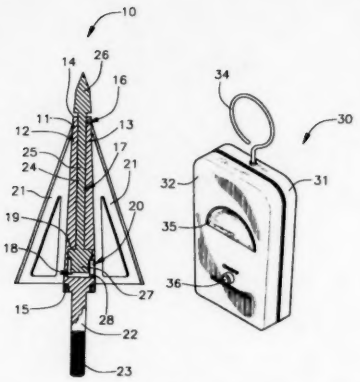
Ricky A. Armold, 7897 W. Country Club Blvd., Boca Raton, Fla. 33487

Filed Jan. 26, 2001, Appl. No. 770,257

Int. Cl. F42B *6/04*

U.S. Cl. 473—578 **10 Claims**

1. A hunting arrow tracking system comprising:



an arrowhead member including a tubular member having a side wall, an open front end, a closed back end, and a bore being disposed in said tubular member through said open front end;

a piston member being movably disposed in said bore of said tubular member;

a transmitter being removably disposed in said bore of said tubular member and being adapted to send out signals; and

a receiver unit including a housing member and being adapted to receive signals from said transmitter.

US 6,409,618 B1

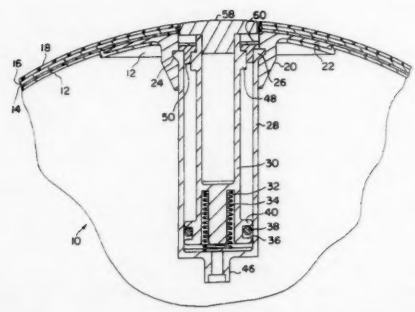
SELF-CONTAINED SPORT BALL INFLATION MECHANISM

Daniel P. Touhey, Lee, Mass.; Brian P. Feeney, East Windsor, Conn.; Joseph E. Stahl, Southampton, Mass.; Neil T. Amundsen, Minneapolis; Louis F. Polk, Excelsior, both of Minn.; Joseph J. Schachtner, Deer Park, Wis.; Kenneth V. Schomburg, Wayzata; George D. Stickler, Shorewood, both of Minn.; Richard F. Terrazzano, Salem, N.H.; Eric K. Litscher, Hopkinton, Mass.; Andrew C. Harvey, Waltham, Mass.; Malcolm E. Taylor, Pepperell, Mass.; Peter M. de Bakker, Hudson, Mass.; Robert C. Sykes, Burlington, Mass., and Charles Keane, Hingham, Mass., assignors to Spalding Sports Worldwide,Inc., Chicopee, Mass.

Continuation-in-part of application No. 09/478,225, filed on Jan. 6, 2000, now Pat. No. 6,287,225, Provisional application No. 60/159,311, filed on Oct. 14, 1999. This application Jun. 15, 2000, Appl. No. 594,980.

Int. Cl. A63B *37/00*

U.S. Cl. 473—593 **19 Claims**



1. An inflatable sport ball comprising an integral pump, wherein said pump is inside said ball and includes means selectively extendable outside of said ball for actuating said pump, and further wherein said pump is essentially flush with or below the surface of the ball when not in use.

US 6,409,619 B1

ARRANGEMENT IN CONNECTION WITH BELT DRIVE DEVICE

Jarkko Sjöblom, Nummela, Finland, assignor to Maillefer S.A., Ecublens, Switzerland

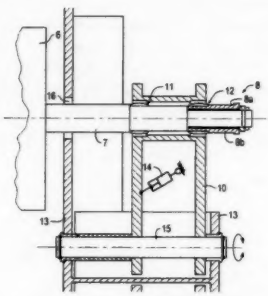
PCT No. PCT/FI99/00241, § 371 Date Sep. 25, 2000, § 102(e) Date Sep. 25, 2000, PCT Pub. No. WO99/48785, PCT Pub. Date Sep. 30, 1999

PCT Filed Mar. 24, 1999, Appl. No. 623,236

Claims priority, application Finland, Mar. 26, 1998, 980683

Int. Cl. F16H *7/22;7/14*

U.S. Cl. 474—107 **14 Claims**



1. An arrangement in connection with a belt drive device having two continuous drive belts which are driven by drive rollers, the drive belts arranged to travel around a plurality of stretching rollers such that the belts form continuous and adjacent loops at a distance from each other and are arranged to be pressed by press rolls against opposite surfaces of a cable to be drawn between the drive belts, the arrangement comprising an adjustment mechanism on an axle, the adjustment mechanism positioned at an end of the axle opposite a side at which at least one of the stretching rollers is positioned to adjust an axial angle of at least one of the stretching rollers of the belt drive device.

US 6,409,620 B1

BELT FOR CONTINUOSLY VARIABLE TRANSMISSION

Hideaki Yoshida, and Takamichi Shimada, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 2000, Appl. No. 615,053

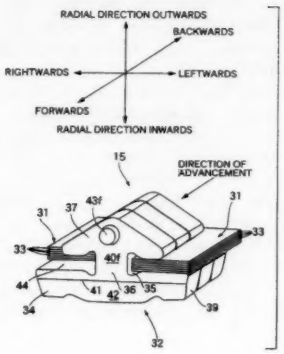
Claims priority, application Japan, Jul. 13, 1999, 11-198615

Int. Cl. F16G *5/16;1/22*

U.S. Cl. 474—242 **7 Claims**

2. A belt for a continuously variable transmission having a drive pulley and a driven pulley, comprising a metal ring assembly and a plurality of metal elements, each metal element having front and rear main surfaces for contact with adjacent ones of metal elements, said metal elements being supported on said metal ring assembly with the rear main surface of a preceding metal element being in contact with the front main surface of a succeeding metal element, said belt being wound around the drive pulley and the driven pulley to transmit a driving force between the drive pulley and the driven pulley, wherein

the rear main surface of said each metal element has protrusions projecting rearward therefrom at predetermined locations with respect to laterally opposite ends in a region near a rocking edge of said each metal element, and the front main surface of said each metal element has at least one flat surface portion, the protrusions contacting the flat surface portion of an adja-



cent metal element at least at laterally opposite ends in a region near the rocking edge, wherein said flat surface portion is perpendicular to the forward and rearward directions; and

wherein said rocking edge of said each metal element permits relative rotation between said each metal element and said adjacent metal element by coming into contact with said adjacent metal element.

US 6,409,621 B1

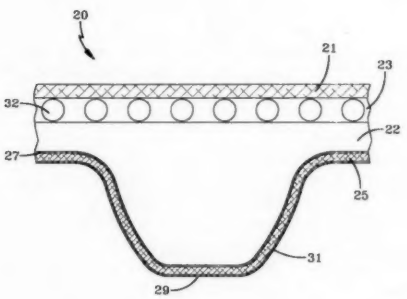
POWER TRANSMISSION BELT

Wesley James Billups; Dennis Dean Kottwitz; Jeffery Dwight Lofgren, and Matthew Thomas Morris, all of Lincoln, Nebr., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 12, 2000, Appl. No. 569,996

Int. Cl. F16G *1/00;5/00*

U.S. Cl. 474—263 **9 Claims**



1. An endless power transmission belt comprising

(a) a tension section;

(b) a cushion section;

(c) a load-carrying section disposed between said tension section and cushion section; and

(d) at least one drive surface having a fabric layer bonded to an outer surface of the belt, the improvement comprising a coating layer of polyvinylidene fluoride is adhered onto the surface of the fabric layer and the polyvinylidene fluoride is selected from the group consisting of a homopolymer of vinylidene fluoride and copolymers of vinylidene fluoride and another monomer which is selected from the group consisting of tetrafluoroethylene, hexafluoropropylene, monochlorotrifluoroethylene, vinyl fluoride, perfluorovinylalkyl ethers, vinyl acetate and ethylene.

US 6,409,622 B1

ELECTRIC MOTOR WITH DRIVE

Martin-Peter Bolz, Oberstenfeld; Ferdinand Grob, Besigheim, and Stefan Tumback, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

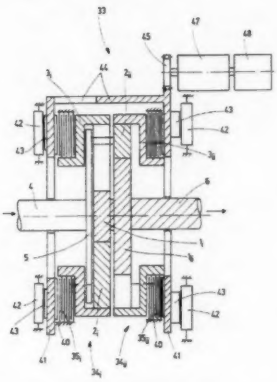
PCT No. PCT/DE99/03522, § 371 Date Nov. 1, 2000, § 102(e) Date Nov. 1, 2000, PCT Pub. No. WO00/29744, PCT Pub. Date May 25, 2000

PCT Filed Nov. 4, 1999, Appl. No. 600,089

Claims priority, application Germany, Nov. 14, 1998, 198 52 607; Jun. 16, 1999, 199 27 521

Int. Cl. F16H *3/62*

U.S. Cl. 475—5 **27 Claims**



1. A synchronous or asynchronous electrical machine for an internal combustion engine, said electrical machine being reversible for operation as a starter or as a generator of the internal combustion engine,

wherein said electrical machine comprises a two-stage planetary gear device coupled to a shaft of the internal combustion engine, said two-stage planetary gear device comprising two stages, and respective braking devices assigned to the two stages for braking the two stages to halt a rotary motion therein;

wherein said two-stage planetary gear device includes means for operation with a predetermined gear ratio of 4 to 60 in a starter mode and with a predetermined gear ratio of 1.6 to 4 in a generator mode, said predetermined gear ratio in said generator mode is different from said predetermined gear ratio in said starter mode and a ratio of said gear ratio in said starter mode to said gear ratio in said generator mode is at least two.

US 6,409,623 B1

APPARATUS CAPABLE OF DRIVING VEHICLE IN REVERSE DIRECTION WITH ENGINE AS WELL AS ELECTRIC MOTOR

Kazumi Hoshiya, Gotenba, and Hidehiro Oba, Aichi-gun, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

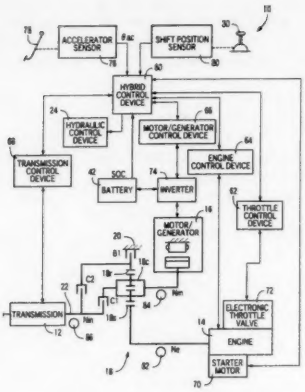
Filed Oct. 6, 2000, Appl. No. 680,707

Claims priority, application Japan, Oct. 8, 1999, 11-287933

Int. Cl. F16H *3/72*

U.S. Cl. 475—5 **6 Claims**

1. A vehicle rear driving apparatus for driving an automotive vehicle in a reverse direction, the automotive vehicle having a drive power source, an output member operatively connected to a drive wheel of the vehicle for driving the vehicle, a synthesizing/distributing device of gear type including a housing, a first rotary element, a second rotary element and a third rotary element, said first and second rotary elements being rotated in respective opposite directions when said third rotary element is stationary, and connected to said drive power source and said output member,



respectively, and a brake for fixing said third rotary element to said housing, wherein an improvement comprises:

said brake being a frictional coupling device capable of effecting a slipping engagement; and

reverse friction-drive control means operable when said first rotary element is rotated in a forward direction with an operation of said drive power source, while said third rotary element is rotated in the forward direction with a rotary motion of said first rotary element, said reverse friction-drive control means controlling said brake to effect said slipping engagement so as to restrict a rotary motion of said third rotary element, for thereby causing a drive torque to act on said second rotary element in a reverse direction to drive the vehicle in the reverse direction.

US 6,409,624 B1

HYDRAULIC CONTROL SYSTEM OF AUTOMOTIVE AUTOMATIC TRANSMISSION

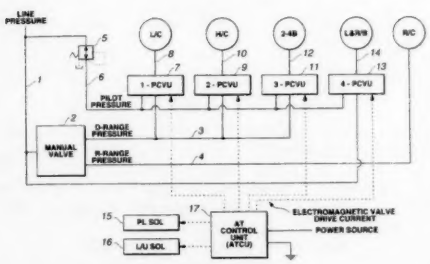
Takashi Sano, Shizuoka, Japan, assignor to Jatco Transtechnology Ltd., Fuji, Japan

Filed Jun. 23, 2000, Appl. No. 599,548

Claims priority, application Japan, Jun. 29, 1999, 11-183836

Int. Cl. F16H *31/00*

U.S. Cl. 475—116 **6 Claims**



1. In an automatic transmission having a frictionally engaging element that is hydraulically actuated for assuming a plurality of gear positions,

a hydraulic control system comprising:

a first hydraulic section that produces a line pressure;

a solenoid valve that produces a solenoid pressure upon receiving a solenoid signal;

a first pressure control valve that produces a first output pressure from said line pressure by using said solenoid pressure and said first output pressure as operation signal pressures, said first output pressure having a smaller gain with respect to said solenoid pressure;

a second pressure control valve that produces a second output pressure from said line pressure by using said solenoid pressure and said second output pressure as operation signal pressures, said second output pressure having a larger gain with respect to said solenoid pressure; and

a switching valve that selectively assumes a first position to feed said engaging element with said first output pressure when the engagement of said engaging element brings about a higher gear position that needs a smaller torque contribution, and a second position to feed said engaging element with said second output pressure when the engagement of said engaging element brings about a lower gear position that needs a larger torque contribution.

US 6,409,625 B1

CONTROLLER OF TOROIDAL CONTINUOUSLY VARIABLE TRANSMISSION

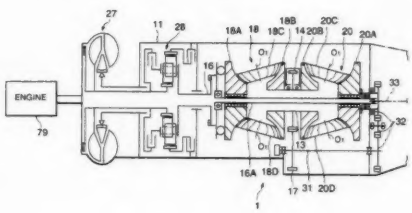
Hiromasa Sakai; Tsutomu Yamazaki, both of Yokosuka, and Motoharu Nishio, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 9, 2000, Appl. No. 708,706

Claims priority, application Japan, Nov. 10, 1999, 11-319571; Feb. 29, 2000, 2000-053133

Int. Cl. F16H *37/02*

U.S. Cl. 475—208 **14 Claims**



1. A controller for a toroidal continuously variable transmission of a vehicle, the transmission comprising an input disk which rotates about a rotation shaft, an output disk which rotates about the rotation shaft, a power roller gripped by the input disk and the output disk and transmitting a torque between the input disk and output disk, and a trunnion which drives the power roller in a direction perpendicular to the rotation shaft according to a differential pressure of a first oil chamber and a second oil chamber, the transmission causing a downshift when the second oil chamber is at a higher pressure than the first oil chamber, and causing an upshift when the first oil chamber is at a higher pressure than the second oil chamber, the first oil chamber being connected to a first passage and the second oil chamber being connected to a second oil passage, the controller comprising:

a speed ratio control valve which controls a direction and a flowrate of oil in the first oil passage and the second oil passage; and

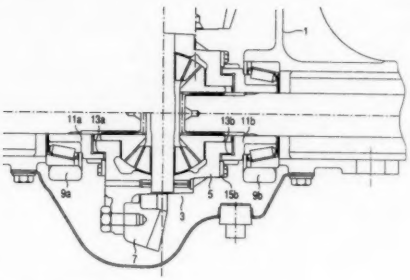
a pressure control valve which limits a maximum differential pressure of the first oil chamber and the second oil chamber when the transmission causes a downshift smaller than a maximum differential pressure of the first oil chamber and the second oil chamber when the transmission causes an upshift.

US 6,409,626 B1

AXLE ASSEMBLY HAVING A DIFFERENTIAL CASE ADJUSTABLY SECURED TO A HOUSING

Earl James Irwin, Fort Wayne, Ind., assignor to Spicer Technology, Inc., Ft. Wayne, Ind.

Filed Jun. 29, 2000, Appl. No. 605,864
Int. Cl. F16H *48/08*
U.S. Cl. 475—230 **10 Claims**



1. An axle assembly comprising:

a housing;

a differential case rotatably mounted within said housing, said differential case having a ring gear non-rotatably fixed thereto for engaging a pinion gear;

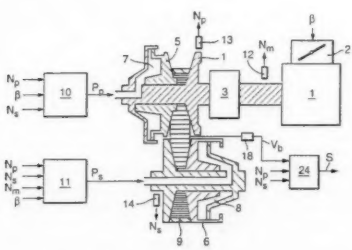
at least one adjustment collar disposed between said differential case and said housing and threadingly engaging said differential case to selectively position said differential case and ring gear relative to said housing.

US 6,409,627 B2

DEVICE AND METHOD FOR REDUCING SLIP IN THE CONTROL SYSTEM OF A CVT IN A MOTOR VEHICLE

Martin-Peter Bolz, Oberstenfeld, and Holger Hülser, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE98/00374, § 371 Date Sep. 24, 1999, § 102(e) Date Sep. 24, 1999, PCT Pub. No. WO98/43003, PCT Pub. Date Oct. 1, 1998
PCT Filed Feb. 11, 1998, Appl. No. 402,132
Claims priority, application Germany, Mar. 25, 1997, 197 12 451
Int. Cl. B60K *41/12*
U.S. Cl. 477—46 **5 Claims**



1. An arrangement for controlling a transmission for a motor vehicle having a drive unit and a drive train, the motor vehicle including a clutch disposed between the drive unit and the transmission, the transmission having a transmission ratio which is continuously variable, the transmission and the drive unit being mounted in the drive train, the drive unit having an adjustable output torque (M_m), the transmission having a drive end and an output end and the transmission including operative means for providing a mechanical operative connection between the drive end and the output end thereof, the arrangement comprising:

detection means for detecting a slip (S) representing the slip between said operative means and at least one of said drive end and said output end of said transmission;

means for initiating a change (Δi) of the transmission ratio (i) as a first measure in response to a pregiven value of said slip (S);

means for initiating at least one of the following measures in response to said pregiven value of said slip (S):

a change (ΔF) of said contact engaging force between said drive end and/or said output end and said operative means in a direction to reduce said slip (S);

a drive (ΔM_K) of said clutch arranged in said drive train; and,

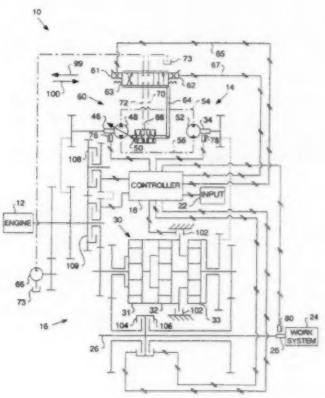
means for initiating a change (ΔM_m) of said output torque of said drive unit as an additional measure in response to said pregiven value of said slip (S).

US 6,409,628 B1

METHOD AND APPARATUS FOR PREVENTING HUNTING BETWEEN RANGES IN A CONTINUOUSLY VARIABLE TRANSMISSION

Brian D. Kuras, East Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Sep. 29, 2000, Appl. No. 676,411
Int. Cl. B60K *41/16*
U.S. Cl. 477—69 **22 Claims**



1. A transmission assembly, comprising:

a continuously variable transmission driven by an input shaft at an input speed;

a mechanical transmission coupled to the continuously variable transmission for selecting a first gear range and a second gear range;

an output shaft driven by the mechanical transmission at an output speed; and

a controller operable to (i) receive a speed command and generate a transmission ratio command which control a ratio of the output speed to the input speed, and (ii) generate a shift command which causes the mechanical transmission to shift from the first gear range to the second gear range, wherein:

an upper transmission ratio limit defined by an engine lug limit,

a lower transmission ratio limit is defined by an engine overspeed limit,

the controller causes the transmission to execute a shift from the first gear range to the second gear range which causes an instantaneous change in output speed, and

the engine lug limit or the engine overspeed limit are adjusted to inhibit a subsequent shift from the second gear range to the first gear range.

US 6,409,629 B1

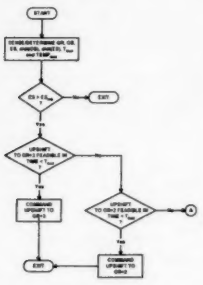
AUTOMATED TRANSMISSION UPSHIFT CONTROL WITH UPSHIFT BRAKE THERMAL PROTECTION

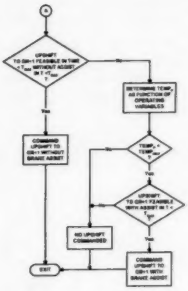
Alan R. Davis, Plainwell, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 17, 2000, Appl. No. 573,873

Int. Cl. F16H *59/14;59/30*

U.S. Cl. 477—98 **20 Claims**





1. A method for controlling automatic upshifting in a vehicular automated mechanical transmission system (**10**) for a vehicle comprising a fuel-controlled engine (**12**), a multiple-speed mechanical transmission (**14**) having an input shaft (**18**) driven by said engine, a friction upshift brake (**26**) for selectively retarding rotation of said input shaft, and a controller (**28**) for receiving input signals (**30**) including one or more of signals indicative of engine speed (ES), engaged gear ratio (GR) and vehicle speed (OS), and to process said input signals in accordance with logic rules to issue command output signals (**32**) to transmission system actuators including a transmission actuator (**52**) effective to shift said transmission and a brake actuator (**26**A) effective to operate said brake, said logic rules including rules for:

(a) establishing upshift feasibility criteria whereby upshifts into a target gear ratio are considered feasible only if, under sensed vehicle operating conditions, said criteria is satisfied, and

(b) determining if upshifts under consideration with use of said brake are feasible,

said method characterized by the steps of:

(i) establishing a maximum allowable temperature ($TEMP_{MAX}$) for said brake;

(ii) determining a predicted brake temperature ($TEMP_p$) at completion of an upshift under consideration using said brake;

(iii) comparing said maximum allowable temperature to said predicted brake temperature; and

(iv) if said predicted brake temperature exceeds said maximum allowable brake temperature ($TEMP_p > TEMP_{MAX}$), then not commanding said upshift under consideration using said brake.

US 6,409,630 B1

POWER OFF UPSHIFT CONTROL METHOD FOR AUTOMATIC TRANSMISSION

Pyung-Hwan Yu, Suwon, Rep. of Korea, assignor to Hyundai Motor Co., Seoul, Rep. of Korea

Filed Aug. 31, 2000, Appl. No. 653,257

Claims priority, application Rep. of Korea, Oct. 29, 1999, 99-47438

Int. Cl. F16H *61/04*

U.S. Cl. 477—154 **5 Claims**

1. A power Off upshift control method for an automatic transmission comprising the steps of:

determining, during an upshift operation, if power Off upshifting is taking place;

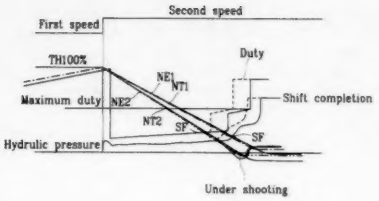
determining if power Off upshift conditions are satisfied;

measuring a hydraulic pressure response time, establishing a maximum duty value for preventing forced shifting, and calculating the hydraulic pressure response time when the maximum duty value changes to 100% duty, these processes being performed if the power Off upshift conditions are satisfied;

calculating a shift finish point after the hydraulic pressure response time is calculated;

determining if the shift finish point corresponds to an actual shift finish point; and

setting the maximum duty value at 100% duty if the shift finish point corresponds to the actual shift finish point.



US 6,409,631 B1

VARIABLE CONFIGURATION EXERCISE MACHINE

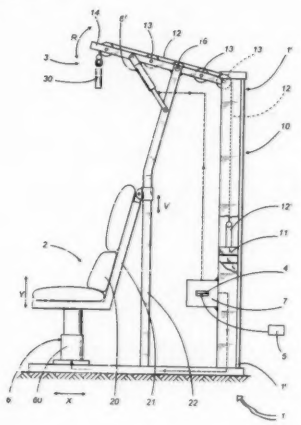
Nerio Alessandri, Longiano, Italy, assignor to Technogym S.r.l., Gambettola, Italy

Filed Jun. 12, 1997, Appl. No. 871,906

Claims priority, application Italy, Jun. 11, 1996, BO96A0325

Int. Cl. A63B *24/00;21/005*

U.S. Cl. 482—4 **39 Claims**



1. An exercise machine with a variable configuration, comprising:

a posture portion;

a machine portion including a movement device and a resisting portion, the movement device being connected to the resisting portion, which provides a resisting force to the movement device, when using the exercise machine, a user applies a force to the movement device, the force being against the resisting force provided to the movement device;

a reader to read a portable medium that constitutes a data storage device with a memory to store data relative to at least one physical measurements of the user and an exercise;

at least one motor-driven adjuster being connected to posture portion, to adjust a relative position between the posture portion and the machine portion;

a controller, connected to the reader and to the motor-driven adjuster, to activate, independently and in a self adjusting manner, the motor-driven adjuster to move the posture portion

along at least one direction so as to change the relative position between the posture portion and the machine portion based only on the data stored in the memory of the storage device of the portable medium; and

a load adjuster to adjust the resisting force provided to the movement device by changing a load in accordance with the exercise to be performed, the load adjuster being connected to the controller and being configured to change the resisting force provided to the movement device in accordance with the data stored in the portable medium.

US 6,409,632 B1

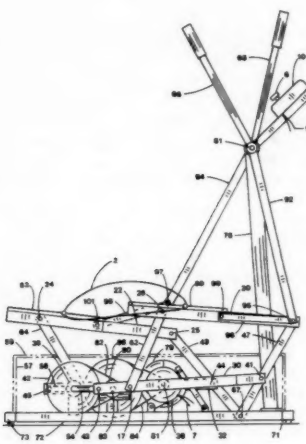
COMPACT ELLIPTICAL EXERCISE MACHINE

Paul William Eschenbach, 143 Lakeland Ave., Moore, S.C. 29369

Continuation-in-part of application No. 09/478,782, filed on Jan. 7, 2000, which is a continuation-in-part of application No. 09/067,261, filed on Apr. 27, 1998, now Pat. No. 6,142,915, which is a continuation-in-part of application No. 08/711,087, filed on Sep. 9, 1996, now Pat. No. 5,788,610. This application Nov. 28, 2000, Appl. No. 723,272.

Int. Cl. A63B *69/16;22/04*

U.S. Cl. 482—52 **27 Claims**



1. An exercise machine comprising:

a framework, said framework configured to be supported by the floor;

a pair of foot support members, each having a first portion, a second portion and a foot engaging pedal;

a crank, said crank rotatably attached to said framework projecting outwardly therefrom on both sides thereof;

a pair of guides, each guide operably associated with said first portion of said foot support member to cause said first portion of said foot support member to have generally back and forth movement;

a pair of linkages, each said linkage positioned below said foot support member and operably associated with said crank to cause said second portion of said foot support member to have generally up and down movement;

said linkages including a coupler link, said coupler link pivotally connected to said crank and, a lifter link, said lifter link pivotally connected to said second portion of said foot support member and pivotally connected to said coupler link;

said pedal configured to move relative to said framework when the foot of the user is rotating said crank whereby said pedal follows an elongate curve path.

US 6,409,633 B1

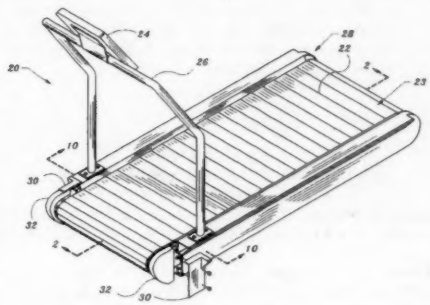
MOVING SURFACE EXERCISE DEVICE

Kevin G. Abelbeck, 1220 Venice Blvd., #205, Venice, Calif. 90291

Division of application No. 09/087,651, filed on May 30, 1998, now Pat. No. 6,042,514. This application Mar. 23, 2000, Appl. No. 534,139.

Int. Cl. A63B *22/00*

U.S. Cl. 482—54 **14 Claims**



1. A moveable surface exercise device comprising:

a frame, including a pair of substantially longitudinal side frames;

a continuous segmented track, including:

a plurality of individual deck members movably connected one to another, thereby creating a continuous loop being disposed so as to enable an upper run and a lower run;

a plurality of support members mounted to said deck members, the support members being received by said frame;

a drive means mounted to said frame and capable of applying force to move said continuous loop along said frame; and

a controller means to vary the force applied by said drive means, whereby said upper run is a continuous surface capable of moving and supporting a load placed on said deck members, the load being transmitted through said support members to said frame.

US 6,409,634 B1

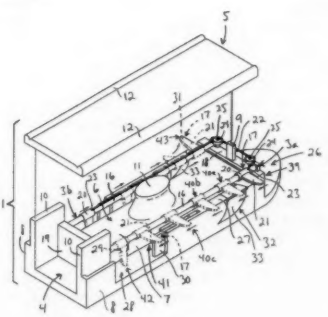
SWIM TRAINING APPARATUS

John Profaci, 16 Dehart Rd., Maplewood, N.J. 07040

Filed Jul. 25, 2000, Appl. No. 624,920

Int. Cl. A63B *69/10*

U.S. Cl. 482—56 **32 Claims**



1. An apparatus for facilitating practice of a swimming stroke by a user, comprising:

an enclosure including a support surface for receiving the user so that hands and arms of the user are free for movement and

so that body portions of the user are supported in a position simulating a position of the user while in water; and

a pair of hand track systems associated with the enclosure and located below the support surface, wherein the hand track systems include grip portions which extend from opposing sides of the enclosure;

wherein the grip portions of the hand track systems which extend from the enclosure are positioned for engagement by the hands of the user; and

wherein the grip portions can assume either of two positions including a first, raised position in which the grip portions are supported for engagement by the hands of the user and a second, lowered position in which the grip portions are received within the enclosure.

US 6,409,635 B1

RECUMBENT EXERCISE APPARATUS WITH ELLIPTICAL MOTION

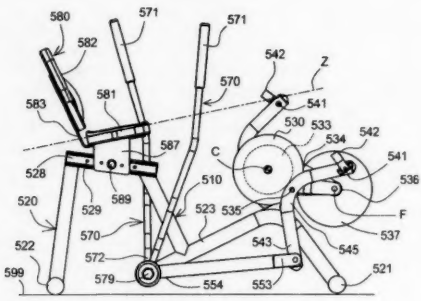
Joseph D. Maresh, 19919 White Cloud Cir., West Linn, Oreg. 97068, and Kenneth W. Stearns, P.O. Box 55912, Houston, Tex. 77255

Continuation of application No. 08/914,278, filed on Aug. 19, 1997, now Pat. No. 5,938,570, which is a continuation-in-part of application No. 08/497,377, filed on Jun. 30, 1995, now Pat. No. 5,707,321. This application Aug. 16, 1999, Appl. No. 374,783.

This patent is subject to a terminal disclaimer.

Int. Cl. A63B *69/16;22/00*

U.S. Cl. 482—57 **16 Claims**



1. A recumbent exercise apparatus, comprising:

a frame designed to remain in a stationary position on a floor surface;

a seat mounted on the frame;

a left crank and a right crank, wherein each said crank is rotatably mounted on the frame and rotatable about a common crank axis disposed forward of the seat;

a left connector link and a right connector link, each said connector link having a first portion, a second portion, and a third portion, wherein the first portion of each said connector link is rotatably connected to a respective crank;

a left foot support and a right foot support, wherein each said foot support is connected to the second portion of a respective connector link;

a left rocker link and a right rocker link, wherein each said rocker link is pivotally interconnected between the frame and the third portion of a respective connector link; and

a left handle and a right handle, wherein each said handle is pivotally mounted on the frame and selectively linked to a respective rocker link, wherein a first fastener is selectively inserted through aligned openings in the left handle and the left rocker link, and a second fastener is selectively inserted through aligned openings in the right handle and the right rocker link.

US 6,409,636 B1

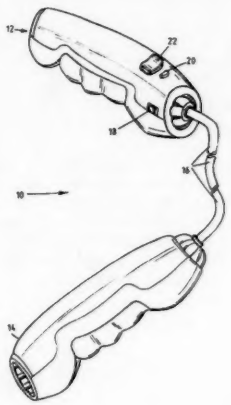
ELECTRONIC JUMP ROPE

Michael D. Risso, Napa; Daniel H. Seifert, Albany, and Sharon M. Caroompas, Fairfield, all of Calif., assignors to Oddzon, Inc., Pawtucket, R.I.

Filed Mar. 24, 2000, Appl. No. 535,482

Int. Cl. A63B *5/20*

U.S. Cl. 482—82 **25 Claims**



1. An electronic jump rope, comprising:

a first handle;

a second handle;

a flexible element connected between said first and second handles;

a first switch disposed in one of said first and second handles;

a second switch disposed in one of said first and second handles;

a speaker disposed in one of said first and second handles; and

a sound generator operatively coupled to said first and second switches and said speaker, said sound generator including a memory, a processor and an input/output circuit disposed in one of said first and second handles, said sound generator being programmed to cause said speaker to play a musical beat track when said first switch is actuated and programmed to cause said speaker to play a sound segment simultaneously with the musical beat track when said second switch is actuated so that each actuation of said second switch causes said speaker to audibly superimpose the sound segment over the musical beat track so that both the sound segment and the musical beat track are simultaneously audible.

US 6,409,637 B1

WEIGHT STACK FRAME

Randall T. Webber, San Diego, and George M. Zink, Escondido, both of Calif., assignors to Hoist Fitness Systems, San Diego, Calif.

Filed Nov. 23, 1999, Appl. No. 448,075

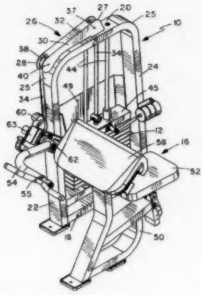
Int. Cl. A63B *21/062*

U.S. Cl. 482—99 **36 Claims**

1. A weight stack frame for supporting the weight stack of an exercise machine, comprising:

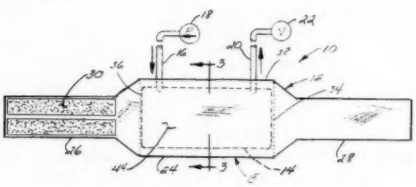
spaced upper and lower struts each having opposite front and rear ends; and

front and rear upright struts extending between the front ends and the rear ends, respectively, of the upper and lower struts to form an enclosed frame, each upright strut having an upper end joining the respective end of the upper strut to form non-perpendicular angles in a plane defined by the upper, front and rear struts, and a lower end joining the respective



ends of the lower strut to form non-perpendicular angles, and the upright struts being parallel to one another.

US 6,409,638 B1
STOMACH AND MID-TORSO MUSCLE TONING DEVICE
Trevor Lee Huston, 452 Longwood Dr., Venice, Fla. 34292
Filed Feb. 8, 2001, Appl. No. 779,678
Int. Cl. A63B *23/00*
U.S. Cl. 482—112 **3 Claims**



1. A stomach and mid-torso muscle exercise and toning device comprising:

an elongated generally flat, flexible member having end portions and inner and outer panels attached together along common margins thereof defining a closed or closable central pouch, said member sized in length to transversely encircle a mid-torso and stomach of a user of said device so that said end portions meet or overlap one another when said member is in an in-use position around the users torso;

a releasable attachment between said end portions to hold said member snugly in the in-use position;

an elongated inflatable bladder having a separate inlet and outlet and being disposed between and generally coextensive with only a central portion of said inner and outer panels;

an air pump and outlet valve operably connected to said inlet and outlet, respectively, whereby said bladder may be selectively pressurized;

said outer panel and said end portions being substantially non-extensible, said inner panel being somewhat expandable whereby, when said bladder is pressurized, increased static force is applied inwardly against the torso and the stomach.

US 6,409,639 B1
STRUCTURE OF EXERCISE WHEEL
Hsiu-Min Kuo, No. 138, Ming Hsing Street, Kweishan Hsiang, Taoyuan Hsien, Taiwan
Filed Aug. 10, 2001, Appl. No. 925,493
Int. Cl. A63B *21/00*
U.S. Cl. 482—140 **4 Claims**

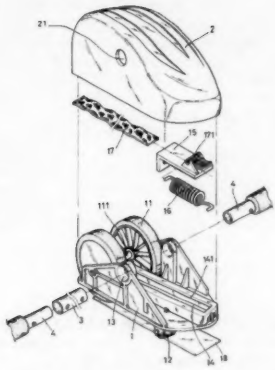
1. An exercise wheel comprising:

a wheel base, said wheel base comprising a wheel axle transversely pivoted thereto near a rear side thereof, two main wheels fixedly mounted on said wheel axle and arranged in parallel, a front balance wheel, a longitudinal sliding track, two coupling holes bilaterally aligned in front of said main wheels above said longitudinal sliding track, a slide longitudinally slidably mounted in said longitudinal sliding track, a torsional spring disposed between said slide and said longitudinal sliding track for providing said slide with a recovery force, and a belt, said belt having a first end fixedly connected to said slide and a second end fixedly connected to said wheel axle;

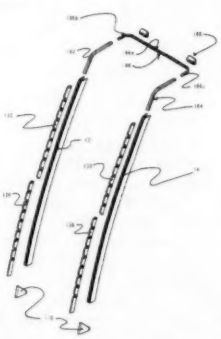
a housing covering said wheel base, said housing comprising two through holes respectively disposed in alignment with the coupling holes of said wheel base at two sides;

a coupling tube press-fitted into the through holes of said housing and the coupling holes of said wheel base; and

two handgrips respectively fastened to two distal ends of said coupling tube and disposed in the outside of said housing.



US 6,409,640 B2
UPPER BODY EXERCISE DEVICE
Yvan Cournoyer, 104, boul. des Châteaux, Blainville (Quebec), Canada, J7B 1K6
Continuation-in-part of application No. 09/370,181, filed on Aug. 9, 1999. This application Feb. 6, 2001, Appl. No. 776,726.
Int. Cl. A63B *26/00*
U.S. Cl. 482—141 **6 Claims**



1. An indoor body exerciser for allowing a person to perform push-ups, sit-ups and the like exercises, said exerciser comprising:

a pair of arcuate elongated posts defining upper and lower ends, said lower ends for stable ground engagement;

a U-shape member having a web and two opposite outturned end portions, said U-shape member releasably interconnecting both of said upper ends of the elongated posts and extending transversely therefrom, wherein said posts become substan-

tially parallel to each other and wherein a web portion is defined by said U-shape member for abutting engagement against an upright support wall spacedly over ground in an operative position of said exerciser, said U-shape member forming a spacer member between the arcuate posts and the upright support wall to keep said arcuat posts generally parallel to the upright support wall;

an elongated hand-engageable push-up bar; and

a pair of elongated first and second insert members, fitting against corresponding said posts and each defining a number of lengthwisely spaced cavities, said push-up bar releasably engaging a selected pair of horizontally aligned said insert member cavities from the two said insert members.

US 6,409,641 B1

CLEANING DEVICE FOR MACHINE TOOL

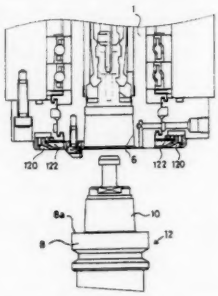
Narihiko Hashimoto, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 5, 1999, Appl. No. 374,677

Claims priority, application Japan, Aug. 10, 1998, 10-225864

Int. Cl. B23Q *3/157; 11/10;* **B23C** *9/00;* **B23B** *47/00*

U.S. Cl. 483—13 **29 Claims**



1. A cleaning device for a machine tool including an automatic tool change mechanism adapted to replace a tool attached to a main shaft by another tool, a pump that supplies coolant, and a cutting fluid nozzle that emits the coolant supplied from the pump, toward a location where a workpiece is machined by the tool, the cleaning device comprising:

at least one cleaning nozzle that emits clean coolant toward at least one portion of the machine tool where adherence of chips affects changing of tools, wherein the at least one cleaning nozzle comprises a nozzle hole that is open downwards, and an inclined wall that faces an opening of the nozzle hole and is inclined so as to direct the coolant from the nozzle hole toward the tool.

US 6,409,642 B2

ASSEMBLING DEVICE

Morio Tominaga; Katsuya Arai, both of Kanagawa; Shoichi Hayashi, Chiba; Kenichi Kato, Saitama; Tsuyoshi Inoue, Kanagawa; Hiroyuki Suzuki; Tetsuo Higewake, both of Tokyo; Hideaki Tomikawa, Saitama; Takeshi Tokita, Chiba; Norifumi Otsuka, Kanagawa, and Hiroshi Teranishi, Tokyo, all of Japan, assignors to Sony Corporation, Japan

Filed May 18, 1999, Appl. No. 313,383

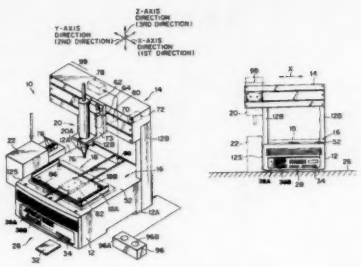
Claims priority, application Japan, May 25, 1998, P10-143211

Int. Cl. B23Q *3/157;* **B23C** *1/00; 1/12*

U.S. Cl. 483—16 **24 Claims**

8. A processing apparatus for processing an object comprising:

a table for supporting said object, a face of said table having a slot for receiving an integrated circuit card, wherein said integrated circuit card contains software for directing said processing of said object, said processing comprising an assembly process;



a pair of columns extending vertically and attached to opposite ends of said table;

a guide means supported on said pair of columns and extending in a first direction parallel to a surface of the table and having an overhang portion;

a moving means including a moveable body disposed above the table, said moveable body being moveable in said first direction along said guide means,

wherein said moving means is moveable to a position as determined by said overhang portion beyond an area between said pair of columns where said table is positioned.

US 6,409,643 B2

TAKE-OUT LEADING ROLL, SPREADER ROLL, OR EQUIVALENT FOR A WEB-LIKE MATERIAL

Lassi Karvonen, Jyskä, and Pekka Koivukunnas, Järvenpää, both of Finland, assignors to Valmet Corporation, Helsinki, Finland

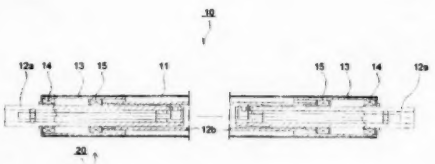
PCT No. PCT/FI97/00663, § 371 Date Jul. 2, 1999, § 102(e) Date Jul. 2, 1999, PCT Pub. No. WO98/19949, PCT Pub. Date May 14, 1998

PCT Filed Oct. 30, 1997, Appl. No. 297,491

Claims priority, application Finland, Nov. 4, 1996, 960546 U

Int. Cl. B29C *43/46*

U.S. Cl. 492—6 **20 Claims**



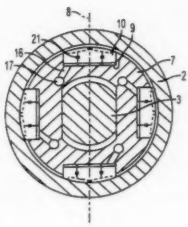
1. A roll for a web-like material comprising:

a non-revolving roll axle (**12***a*, **12***b*);

a roll mantle (**11**) journalled revolvingly by means of bearings (**14**, **15**) on said roll axle, and which roll (**10**) can be bent to a shape of a desired arc, wherein the roll mantle (**11**) is a continuous, tubular mantle and wherein the roll axle consists of three parts linked with one another, said three parts including a first and second end part (**12***a*) and a middle part (**12***b*), which are pivotal in relation to one another for a purpose of bending the roll mantle (**11**); and

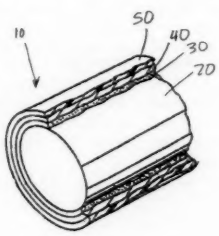
a bending mechanism arranged in said first end part for causing a radial shift of said middle part relative to said first end part.

US 6,409,644 B1
SAG COMPENSATION ROLL AND PROCESS FOR THE OPERATION THEREOF
Rolf Van Haag, Kerken, Germany, assignor to Voith Sulzer Papiertechnik Patent GmbH, Heidenheim, Germany
Filed Sep. 28, 2000, Appl. No. 671,255
Claims priority, application Germany, Oct. 1, 1999, 199 47 398; May 30, 2000, 100 26 939
Int. Cl. B23P *15/00*
U.S. Cl. 492—7 **26 Claims**



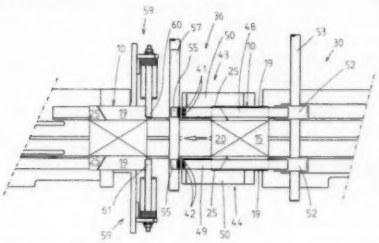
1. A sag compensation roll comprising:
a rotatable roll jacket;
a non-rotating carrier being located inside said roll jacket;
a hydraulic support element arrangement being located between said carrier and said roll jacket;
a bearing ring located at each end of said roll jacket, said bearing rings being movable relative to said carrier in a press plane;
a bearing arrangement being located between said bearing rings and said roll jacket, said bearing arrangement comprising at least three support elements distributed in a circumferential direction;
a bearing pocket arrangement arranged on at least one of the at least three support elements, the bearing pocket being coupled to a supply device; and
said supply device arranged to deliver a constant volume flow of hydraulic fluid,
wherein said at least one of said at least three support elements is movable with respect to said bearing ring, and
wherein, under load, said at least one movable support element is driven into said bearing ring up to a fixed position.

US 6,409,645 B1
ROLL COVER
Jan A. Paasonen, Kerava, and Seppo A. Yliselä, Järvenpää , both of Finland, assignors to SW Paper Inc., Southborough, Mass.
Filed Jun. 13, 1997, Appl. No. 874,757
Int. Cl. F16C *13/00*
U.S. Cl. 492—56 **16 Claims**



1. A covered roll structure employed in the manufacture of a paper machine roll, said structure comprising:
a core roll having a substantially cylindrical outer surface;
a sleeve of removable material surrounding said core roll outer surface;
a sleeve of compressible material surrounding said sleeve of removable material; and
a sleeve of polymeric material surrounding said sleeve of compressible material and said sleeve of removable material.

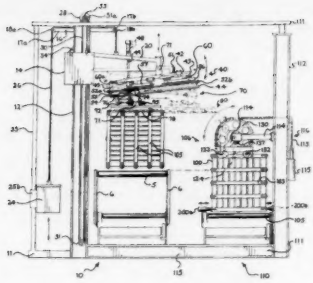
US 6,409,646 B1
HINGE-LID BOX FOR CIGARETTES AND PROCESS AND APPARATUS FOR GLUING PACKAGING MATERIAL
Heinz Focke; Martin Stiller, both of Verden, and Hermann Blome, Blender-Einste, all of Germany, assignors to Focke & Co. (GmbH & Co), Verden, Germany
Filed Dec. 1, 1998, Appl. No. 203,435
Claims priority, application Germany, Dec. 8, 1997, 197 54 328
Int. Cl. B31B *1/62*
U.S. Cl. 493—7 **9 Claims**



1. A process for manufacturing hinge-lid packs for cigarettes, each said pack being made from a blank having a pair of inner box side tabs on opposite sides of said blank, a pair of outer box side tabs on opposite sides of said blank, a pair of inner lid side tabs on opposite sides of said blank and a pair of outer lid side tabs on opposite sides of said blank, the process comprising the steps of:
providing a conveying path for said blanks, wherein a set of nozzles is disposed on each of opposite sides of said conveying path, each said set including two glue nozzles spaced apart transverse to said conveying path and directed upward for applying glue onto surfaces passing over said nozzles in contact therewith;
conveying said blanks with said tabs disposed over said glue nozzles;
feeding glue from said nozzles as said blank is conveyed relative thereto;
pressing said tabs into contact with said glue nozzles as said blank is conveyed relative thereto so as to effect the application by said glue nozzles of two narrow, continuous and parallel strips of glue onto said outer box side tabs and said outer lid side tabs; and
folding said each said blank to bring said outer box side tabs into contact with said inner box side tabs and said outer lid side tabs into contact with said inner side tabs thereby to secure said respective inner and outer side tabs together using said strips of glue to form said hinge-lid pack having a box part and a lid part.

US 6,409,647 B1
DEVICE FOR ASSEMBLING COLLAPSIBLE CONTAINERS
Earl D. Bevins, 8645 17th Ave., and Glenn E. Chernik, 120 68th Pl., both of Kenosha, Wis. 53143
Filed Jun. 27, 2000, Appl. No. 604,195
Int. Cl. B31B *1/78*
U.S. Cl. 493—309 **9 Claims**

1. In a collapsible container having side walls which are pivotal with respect to one another, having no top and a detachable base pallet, the base pallet having a ridge means to receive the walls of the container, wherein the later is secured to the sidewalls by means of a pair of clips, a clip being permanently affixed to each of



a pair of opposite walls and engaging the base pallet through openings in corresponding opposing base pallet ridges, a system for manipulating collapsible containers which unfolds collapsed containers and places them on base pallets, the system comprising:

a. first and second bases;

b. a first upright support member supported by the first base;

c. a roller slide member supported on and movable up and down the first upright support member;

d. a motor means which is capable of moving the roller slide up and down the support member;

e. a switch engagable by the roller slide mounted on the first upright support member;

f. a first horizontal arm fixedly attached to the roller slide and directed towards the second base member;

g. a rail member pivotally attached to the first horizontal support arm, the rail member comprising a first frame, an inverted T-rail being supported by and suspended from the first frame and having a riding surface on each side;

h. a tilting means which is mounted between and to the first horizontal arm and rail member;

i. a trolley means suspended from and movable along the riding surfaces of the T-rail;

j. first and second braking means mounted on the ends of the rail member;

k. a first grasper capable of releasibly engaging a sidewall of a collapsed collapsible container attached to the trolley member, the first grasper comprising a first grasper frame, a grasping means mounted on the underside of the first grasper frame, a second contact switch capable of being engaged by a wall of the collapsed collapsible container attached to the underside of the grasper frame;

l. a second upright member supported by the second base;

m. a second lateral arm mounted on the second upright support member and directed towards the first horizontal arm;

n. a second grasper mounted on the distal end of the lateral arm, the second grasper comprising a frame, a grabbing means mounted on the frame, the grabbing means being capable of releasibly receiving an unfolded container from the first grasper, a third contact switch capable of being engaged by a collapsed collapsible container and activating the grasper;

o. a means to pivot the second grasper being mounted on the second upright support member;

p. a sensor means capable of detecting that the second grasper has pivoted downwards.

US 6,409,648 B1

POLYNUCLEOTIDES ENCODING TRF1 BINDING PROTEINS

Judith Campisi, Berkeley, and Sahn-Ho Kim, Albany, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

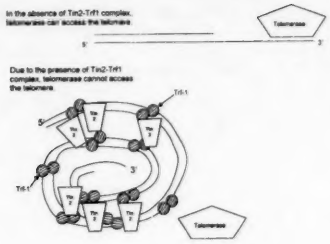
Provisional application No. 60/142,191, filed on Jul. 1, 1999. This application Jun. 30, 2000, Appl. No. 608,917.

Int. Cl. C07H *21/02;21/04;* **C12N** *1/21;15/63;* **C12P** *21/00*

U.S. Cl. 535—69.1 **10 Claims**

10. A method for producing Tin2 protein comprising expressing protein from an isolated polynucleotide, said polynuceotide selected from the group consisting of:

a. SEQ ID NO: 1;


In the absence of Tin2-Trf1 complex, telomerase can access the telomere
Telomerase
5'
3'
Due to the presence of Tin2-Trf1 complex, telomerase cannot access the telomere
T-loop
Telomerase

b. SEQ ID NO: 3;

c. Tin2–12 having a polynucleotide sequence from nucleotides 623–1324 of SEQ ID NO: 1;

d. Tin 2–13 having a polynucleotide sequence from nucleotides 903–1324 of SEQ ID NO: 1;

e. Tin 2–14 having a polynucleotide sequence from nucleotides 263–1089 of SEQ ID NO: 1; and

f. Tin 2–15 having a polynulceotide sequence from nucleotides 263–902 of SEQ ID NO: 1.

US 6,409,649 B1

METHOD FOR COMMERCIAL PREPARATION OF CONJUGATED LINOLEIC ACID USING RECYCLED ALKALI TRANSESTERIFICATION CATALYST

Martin J. T. Reaney, Saskatoon, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Agriculture & Agri-Food Canada, Ottawa, Canada

Filed Nov. 27, 2001, Appl. No. 994,061

Int. Cl. C07B *35/08*

U.S. Cl. 584—126 **20 Claims**

1. A process for producing conjugated linoleic acid or salts thereof from a material rich in linoleate moieties comprising; mixing said material with a waste alkaline glycerol derived from alkali transesterification of triglycerides, heating to a temperature above 170° C., cooling and separating said conjugated linoleic acid by the addition of at least one of the group consisting of a salt, a salt solution and an acid.

US 6,409,650 B2

METHOD FOR BIOSOLID DISPOSAL AND METHANE GENERATION

Michael S. Bruno, Monrovia, Calif.; Maurice B. Dusseault, Osoyoos, and Roman Bilak, Calgary, both of Canada, assignors to Terralog Technologies USA, Inc., Arcadia, Calif., and Terralog Technologies Inc., Calgary, Canada

Continuation-in-part of application No. 09/620,085, filed on Jul. 20, 2000, now Pat. No. 6,287,248, Provisional application No. 60/150,677, filed on Aug. 25, 1999. This application Jul. 27, 2001, Appl. No. 917,417.

This patent is subject to a terminal disclaimer.

Int. Cl. A62D *3/00;* **B09B** *3/00;* **E21B** *43/00;47/06*

U.S. Cl. 588—250 **42 Claims**

1. A method for the disposal of biosolids, the method comprising:

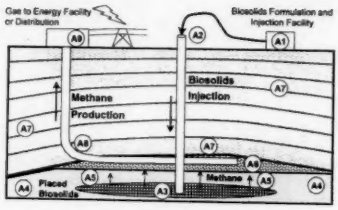
a) providing a supply of biosolids;

b) creating a slurry of the biosolids suitable for injecting;

c) selecting an injection formation below a ground surface and separated from the ground surface by one or more pairs of alternating layers of high permeability and low permeability;

d) injecting the biosolids slurry into the injection formation at a pressure sufficient to create and maintain fractures within the selected injection formation;

e) allowing degradation of the injected biosolids slurry; and



f) monitoring pressure in the one or more than one of the alternating layers of high permeability and low permeability above the injection formation during a time selected from the group consisting of before biosolids injection, during biosolids injection, after biosolids injection and a combination of before biosolids injection, during biosolids injection and after biosolids injection.

US 6,409,651 B1

DEVICE FOR INTRAVASCULAR DELIVERY OF BETA EMITTING ISOTOPES

Charles L. Brown, III, Atlanta, Ga., assignor to GMP/Vascular, Inc., Fort Lauderdale, Fla.

PCT No. PCT/US98/23675, § 371 Date Jul. 13, 2000, § 102(e) Date Jul. 13, 2000, PCT Pub. No. WO99/24117, PCT Pub. Date May 20, 1999

Provisional application No. 60/064,611, filed on Nov. 7, 1997, Provisional application No. 60/080,052, filed on Mar. 31, 1998, Provisional application No. 60/087,202, filed on May 29, 1998. This PCT application Nov. 6, 1998, Appl. No. 530,899.

Int. Cl. A61N *5/00*

U.S. Cl. 600—3 **20 Claims**

1. A device for delivering radiation to an in vivo treatment site comprising:

an inner shielding catheter comprising a radiation shielded lumen and a radiation emitting portion comprising a radiation emitting material movable within the shielded lumen of the shielding catheter, wherein the radiation emitting material is axially slidable between a first configuration in which the radiation emitting material is contained within the shielded lumen and a second configuration in which the radiation emitting material extends from the distal end of the shielding catheter;

an outer catheter comprising at least a first lumen and a second lumen, wherein the first lumen is sized to receive the shielding catheter and the second lumen is capable of receiving a guide wire; and

a radiation proof valve on the distal end of the shielded lumen.

US 6,409,652 B1

DEVICE AND METHOD FOR DELIVERY OF UNIFORM AND CONTROLLED RADIATION DOSE TO BLOOD VESSELS

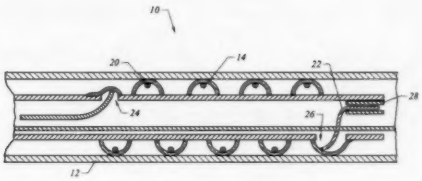
Kirti P. Kamdar, Sunnyvale; Majid Leonard Riaziat, San Jose, both of Calif.; William K. Wheeler, Austin, Tex., and Raisa Pavlyuchkova, Palo Alto, Calif., assignors to Vascular Architects, Inc., San Jose, Calif., and Varian Medical Systems, Inc., Palo Alto, Calif.

Filed Sep. 20, 2000, Appl. No. 665,729

Int. Cl. A61N *5/00*; **A61M** *31/00*

U.S. Cl. 600—3 **21 Claims**

16. A method for delivering a substantially uniform radiation dose to a lumen wall, comprising:



locating an inflatable balloon in the lumen;

placing a radioactive source within said inflatable balloon;

inflating said inflatable balloon, wherein an external wall of the inflated balloon substantially abuts the lumen wall, and wherein said radioactive source substantially abuts an internal wall of the inflated balloon; and

drawing said radioactive source along the internal wall of the inflated balloon such that a substantially uniform radiation dose is delivered to the lumen wall.

US 6,409,653 B1

TREATMENT UNIT FOR THE INTENSIVE CARE UNIT

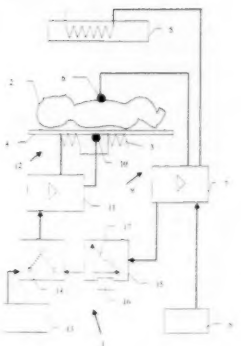
Jochim Koch, Ratzeburg; Hans Ulrich Schüler, Lübeck, and Wolf Dieter Schmidt, Bad Schwartau, all of Germany, assignors to Dräger Medizintechnik GmbH, Germany

Filed May 1, 2000, Appl. No. 562,811

Claims priority, application Germany, May 3, 1999, 199 20 150; Mar. 4, 2000, 100 10 720.6

Int. Cl. A61G *11/00*

U.S. Cl. 600—22 **12 Claims**



1. A treatment unit, comprising:

a first heat source;

a second heat source;

a lying surface for a patient;

a first temperature control circuit with said first heat source, a first temperature controller, a first temperature sensor, detecting the body temperature of the patient, a first set point setter for the body temperature;

a second temperature control circuit for setting the temperature of the lying surface with said second heat source at the lying surface, a second temperature controller, and a second temperature sensor detecting the temperature of the lying surface;

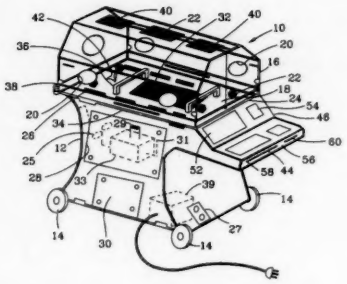
a logic circuit which receives the actual value of the body temperature or the set point of the first control circuit set on the set point setter, as a command variable, and sends a tracking value for the temperature of the lying surface to the second control circuit via a first logic function.

US 6,409,654 B1

INCUBATOR SYSTEM WITH MONITORING AND COMMUNICATING CAPABILITIES

Anthony McClain, 364 Shadetree La., Lawrenceville, Ga. 30044

Filed Aug. 15, 2000, Appl. No. 637,377
Int. Cl. A61G *11/00;* **A47C** *20/02*
U.S. Cl. 600—22 **5 Claims**



1. In combination with an incubator having a transparent enclosure adapted to receive an infant supporting means in a controlled environment, a system for controlling, monitoring and communicating data and images to remote locations, the system comprising:

a.) within said incubator,

i.) a ventilating system, operable by a fan and motor, to control the atmospheric environment within the enclosure, including control means for monitoring a threshold level of noise from said fan and said motor, whereby said threshold level is reached a signal will be generated to monitoring personnel of the malfunction;

ii.) a weight scale to monitor changes in weight of the infant;

iii.) a pair of cameras trained at different angles on the infant;

iv.) a microphone/speaker system for transmitting sounds into and out of said incubator;

v.) an on site X-ray means;

b.) externally of said incubator,

i.) a control console;

ii.) a touchscreen display panel with processor to control various functions of the incubator,

iii.) a primary display panel to monitor functions within the incubator; and

c.) means remote from said incubator in communication through a hub interface with said components within said incubator and externally of said incubator, where said means include

i.) a central station server having a modem;

ii.) an internet server having a second modem in communication with said central station server, where said second modem is in further communication with a world wide internet system for pictorially accessing images from said incubator.

US 6,409,655 B1

DEVICE FOR APPLYING STIMULI TO A SUBJECT

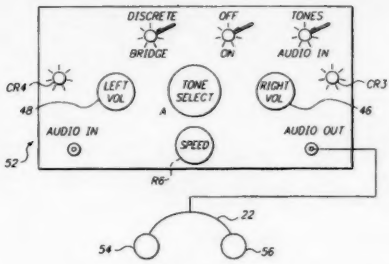
David L. Wilson, 616 Azalea Ave., Redding, Calif. 96002, and Douglas C. Fisher, 5151 Ward Rd., #3, Wheatridge, Colo. 80033

Filed Mar. 5, 1999, Appl. No. 263,116
Int. Cl. A61M *21/00*
U.S. Cl. 600—28 **8 Claims**

1. A device for applying therapeutic stimuli to a subject, comprising:

a. means for generating a selected audio tone signal;

b. audio speaker means transducing said audio tone signal into a selected audio tone and continuously delivering said selected audio tone to the left and right ears of the subject, said audio



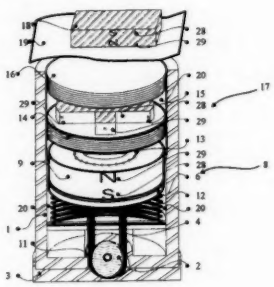
speaker means sequentially delivering of said audio tone to the subject's left ear, both the left and right ears, and the right ear of the listener, without interruption of said audio tone.

US 6,409,656 B1

ARTIFICIAL SPHINCTER WITH MAGNETIC CONTROL

Patrick Sangouard, 20, chemin des Boutareines - F -, 94350 Villiers sur Marne, and Bernard Greillier, 38, avenue des Frères Lumière - F -, 69008 Lyons, both of France

PCT No. PCT/FR98/02184, § 371 Date May 8, 2000, § 102(e) Date May 8, 2000, PCT Pub. No. WO99/18885, PCT Pub. Date Apr. 22, 1999
PCT Filed Oct. 13, 1998, Appl. No. 529,708
Claims priority, application France, Oct. 15, 1997, 97 12918
Int. Cl. A61F *2/02;* **F04B** *17/00*
U.S. Cl. 600—30 **16 Claims**



1. A magnetically controlled artificial sphincter valve (**17**) designed to be installed permanently on one of a duct (**2**) and an organ, whether biological or not, in a human body, the artificial sphincter valve (**17**) comprising;

a mechanical means of closure (**8**) having a first element (**9**) sensitive to a first magnetic field for closing one of said duct and said organ within a desired degree of closure;

an adjustment means (**14**) for adjusting a second element (**15**) sensitive to a second magnetic field to define the desired degree of closure;

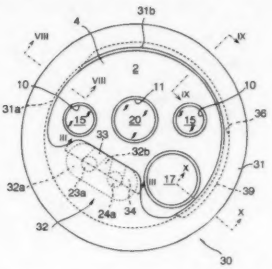
a first magnetic control means (**18**) located outside said human body designed to generate the first magnetic field to activate said first element; and

a second magnetic control means (**27**) located outside said human body to generate the second magnetic field and adjust said second element (**5**) and regulate the degree of closure of said mechanical means (**8**) in closing one of said duct (**2**) and said organ.

US 6,409,657 B1
CLEANING DEVICE FOR CLEANING VIEW WINDOW OF ENDOSCOPE

Hirotaka Kawano, Saitama, Japan, assignor to Fuji Photo Optical. Co., Ltd., Saitama, Japan

Filed Mar. 30, 2000, Appl. No. 537,730
Claims priority, application Japan, Mar. 31, 1999, 11-091796
Int. Cl. A61B *1//12*
U.S. Cl. 600—157 **10 Claims**



1. A medical endoscope having an insertion section including a viewing head which is connected to an operating section through a flexible section and includes an illumination system located behind an illumination window, a viewing lens system located behind a viewing window, fluid feed means for feeding at least cleaning fluid to the viewing window, and suction feed means for feeding suction to the viewing head, said medical endoscope comprising:

a generally cylindrical viewing head casing for housing said illumination system, said viewing lens system and said fluid feed means therein;

a generally annular-shaped viewing head cap detachably fitted to said generally cylindrical viewing head casing, said viewing head cap being formed so as to have a generally cylindrical wall extending a predetermined height from a distal end of said viewing head casing in a lengthwise direction of said insertion section;

a fluid feeding nozzle having a fluid injection port through which said cleaning fluid can be fed, said fluid feeding nozzle being formed integrally with said generally annular-shaped viewing head cap and configured to form a fluid path which is brought into communication with said fluid feed means when said generally annular-shaped viewing head cap is fitted to said generally cylindrical viewing head casing and is turned to direct said cleaning fluid through said fluid feed means toward said viewing window; and

a drain path opening to a space formed between said cylindrical wall of said generally annular-shaped viewing head cap and said distal end of said viewing head at a distal end and being in communication with said suction feed means a proximal end so that liquid that stays in said space is sucked through said drain path into said suction feed means.

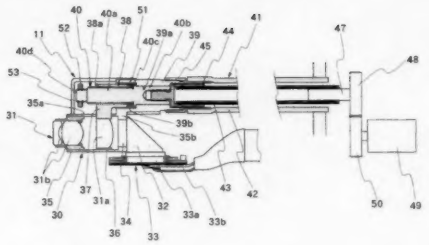
US 6,409,658 B1
ENDOSCOPE WITH OBJECTIVE LENS DRIVE MECHANISM

Naotake Mitsumori, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Dec. 14, 1999, Appl. No. 460,440
Claims priority, application Japan, Dec. 14, 1998, 10-354722; Dec. 24, 1998, 10-366224; Jan. 11, 1999, 11-004396; Jan. 11, 1999, 11-004397; Jan. 22, 1999, 11-014133; Sep. 30, 1999, 11-278192
Int. Cl. A61B *1/04*
U.S. Cl. 600—167 **14 Claims**

1. An endoscope with an objective lens drive mechanism, comprising:

an optical objective lens system incorporated into a rigid tip end section connected to a distal end of an elongated flexible body



of an insertion instrument of said endoscope through an angularly bendable angle section and having a fixed lens mounted on a fixed lens frame provided within said rigid tip end section and a movable lens mounted on a movable lens frame for sliding movement in a direction toward and away from said fixed lens along inner surfaces of said fixed lens frame;

guide surfaces formed on an inner periphery of said fixed lens frame for guiding sliding movements of said movable lens frame in alignment with an optical axis of said objective lens system;

a rotational drive shaft for reciprocating said movable lens frame back and forth in the direction of the optical axis of said objective lens system;

an arm portion extended out from said movable lens frame in a radially outward direction substantially perpendicularly to said optical axis of said objective lens system for engagement with said rotational drive shaft;

a bearing member provided on said fixed lens frame and adapted to support said rotational drive shaft rotatably relative to said fixed lens frame but to block movements of said rotational drive shaft in an axial direction;

a control cable including a flexible transmission shaft connected between said rotational drive shaft and a rotational drive means to transmit rotation from said rotational drive means to said rotational drive shaft, and sheathed in a fixed sleeve having a fore end thereof securely fixed to said bearing member; and

a plurality of stopper members provided on said rotational drive shaft to delimit forward and rearward stroke end positions of said movable lens frame.

US 6,409,659 B1
METHOD AND APPARATUS FOR DISPLAYING PHYSIOLOGICAL PATIENT DATA

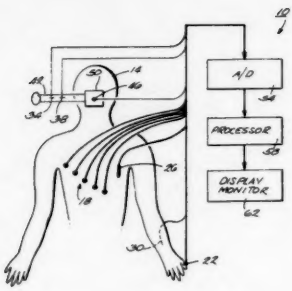
Robert A. Warner, Durham, N.C.; Kevin P. Jessup, West Bend, Wis.; Gardar T. Middleton, New Berlin, Wis.; Mark Palma, Hartford, Wis., and Hansdieter Moessner, Voerstetten, Germany, assignors to GE Medical Systems Information Technologies, Inc., Milwaukee, Wis.

Filed Nov. 4, 1998, Appl. No. 186,310
Int. Cl. A61B *5/00;5/02*
U.S. Cl. 600—300 **19 Claims**

1. A method of displaying a physiological patient data waveform, to readily allow detection of changes in the waveform over time, the patient data waveform including physiological patient data having a plurality of data points, each data point representing an amplitude for the physiological patient data, said method comprising:

a. acquiring the physiological patient data; and

b. displaying the physiological patient data as at least one waveform on a monitor having an X coordinate axis and a Y



coordinate axis, said displaying including assigning each data point a color corresponding to the amplitude of the data point.

US 6,409,660 B1

PORTABLE TELEMEDICINE DEVICE

Bengt Arne Sjöqvist, Tärneskärsgatan, Sweden, assignor to Ortivus AB, Vastra Frolunda, Sweden

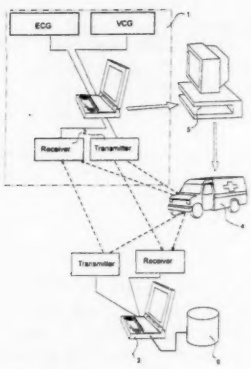
PCT No. PCT/SE97/01587, § 371 Date May 10, 1999, § 102(e) Date May 10, 1999, PCT Pub. No. WO98/11820, PCT Pub. Date Mar. 26, 1998

PCT Filed Sep. 19, 1997, Appl. No. 254,428

Claims priority, application Sweden, Sep. 19, 1996, 9603428; Sep. 19, 1996, 9603429

Int. Cl. A61B *5/00*

U.S. Cl. 600—300 **16 Claims**



1. A portable telemedicine device used in prehospital, preliminary diagnostic procedures and treatments comprising:

at least one measurement device for obtaining patient related information;

an entry device for manual input of information;

communication equipment for permitting bidirectional communication with at least one central unit for transmitting data to the central unit and to receive information data from the central unit; and

means for assigning priorities to different types of information upon transmission of data to the central unit, said priorities being based on the medical usefulness of the information type, and for ensuring that the information type of highest priority in a predetermined situation is transmitted first.

US 6,409,661 B1

DIAGNOSTIC APPARATUS

Graham Francis Murphy, Alresford, United Kingdom, assignor to Remote Diagnostic Technologies Limited, Basingstoke, United Kingdom

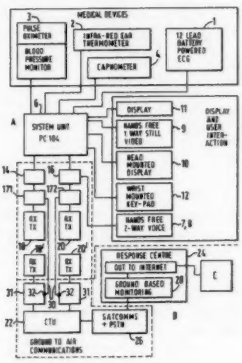
PCT No. PCT/GB98/00613, § 371 Date Dec. 21, 1999, § 102(e) Date Dec. 21, 1999, PCT Pub. No. WO98/40009, PCT Pub. Date Sep. 17, 1998

PCT Filed Feb. 27, 1998, Appl. No. 380,724

Claims priority, application United Kingdom, Mar. 8, 1997, 9704843

Int. Cl. A61B *5/00*

U.S. Cl. 600—300 **42 Claims**



1. Diagnostic Apparatus comprising:

a plurality of sensing means (**1–4**) for sensing data of a body;

means (**7**,**8**) for producing and reproducing voice signals, the producing and reproducing means being arranged to be used by an operator hands-free;

a first communications means (**14**,**20**) coupled to the producing and reproducing means, and a second communications means (**16**,**18**);

display means (**11**); and

processing means (**6**) arranged to

i) process the data, ii) display the processed data on the display means (**11**), iii) control the first and second communications means to automatically establish respective links to a remote location, and iv) supply the processed data to the second communications means;

the apparatus being arranged so that in use two-way voice communication is established between the said operator and an expert at the remote location and the sensed data is transferred to the remote location via the second communications link to allow the said expert to diagnose a condition of the body and to communicate the diagnosis to the said operator.

US 6,409,662 B1

PATIENT INTERFACE SYSTEM

Lester John Lloyd, Orinda, Calif., and Melissa Ann Prince, Winchester, Ky., assignors to Alere Medical, Inc., Concord, Calif.

Continuation of application No. 08/958,689, filed on Oct. 28, 1997, now Pat. No. 6,080,106. This application Sep. 20, 1999, Appl. No. 399,982.

Int. Cl. A61B *5/00*

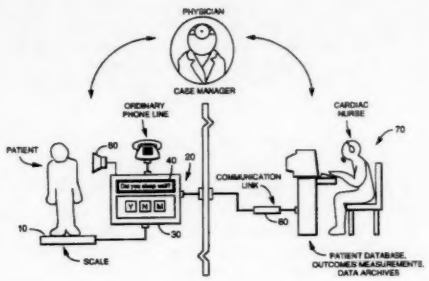
U.S. Cl. 600—300 **28 Claims**

1. A patient interface system for use in collecting and transferring data from a patient to a remote monitoring system, said system comprising:

(a) a patient data imput means comprising:

(i) a means for measuring edema in the patient; and

(ii) an interrogation means;



(b) a processing means for receiving and storing data from said patient data input means;

(c) a communication means for transferring said processed patient data from said processing means to a remote monitoring system and receiving instructional data from said remote monitoring system.

US 6,409,663 B1

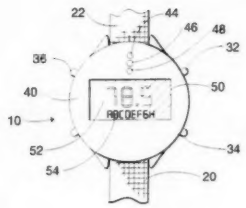
APPARATUS AND METHOD FOR MONITORING THE VITAL STATUS OF BIOLOGICAL MATERIALS

Steven F. Mercereau, 4911 W. Lake Dr., Conyers, Ga. 30208

Filed Nov. 12, 1999, Appl. No. 439,873

Int. Cl. A61B *5/00*

U.S. Cl. 600—300 **15 Claims**



1. An apparatus for monitoring a vital status indicator of a biological material, comprising:

a temperature sensor for sensing periodically a temperature of a biological material to be monitored for determining an indicator of a vital status of the biological material, said temperature sensor adapted to create a first electrical signal representative of the sensed temperature;

a pressure sensor for sensing periodically a pressure of the biological material substantially contemporaneously with the sensing by the temperature sensor and adapted to create a second electrical signal representative of the sensed pressure;

a signal transmitting pathway transmitting said first and second electrical signals to a signal receiver adapted to receive at least two of said first and second electrical signals for processing of the signals;

an evaluator that compares the difference in the two first electrical signals representative of temperatures sensed at a first time and a second time with the difference in the two second electrical signals representative of the pressures sensed, determine the indicator of the vital status as a representative value indicative of the state of the biological material; and

a reporter for communicating the indicator of the vital status of the biological material,

whereby the vital status of the biological material can be monitored.

US 6,409,664 B1

NOMOGRAMS TO AID IN THE TREATMENT OF PROSTATIC CANCER

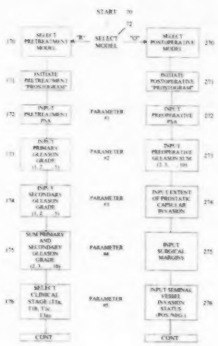
Michael W. Kattan, 504 E. 63rd St., Apt. 20P, and Peter T. Scardino, 345 E. 68th St., Apt 2B, both of New York, N.Y. 10021

Continuation of application No. 09/104,218, filed on Jun. 25, 1998, now Pat. No. 5,993,388, Provisional application No. 60/051,478, filed on Jul. 1, 1997. This application Nov. 24, 1999, Appl. No. 444,706.

This patent is subject to a terminal disclaimer.

Int. Cl. A61B *5/00;19/00*

U.S. Cl. 600—300 **64 Claims**



1. An apparatus for predicting a quantitative probability of disease recurrence in a patient with prostatic cancer following an identified therapy, wherein the apparatus comprises:

a correlation of factors determined for each of a plurality of persons previously diagnosed with prostatic cancer and having been treated by said identified therapy with incidence of recurrence of prostatic cancer for each person of said plurality of persons, wherein said selected set of factors comprises two or more factors selected from the group consisting of pretreatment PSA level, combined Gleason grade, specimen Gleason sum, clinical stage, surgical margin status, prostatic capsular invasion maximum cancer length in a core, total length of cancer in the biopsy cores, percent of cores positive level, extraprostatic extension, level of extraprostatic extension, apoptotic index, percent of cancer in one or more cores, percent of high grade cancer in one or more cores, total tumor volume, zone of location of the cancer, presence of seminal vesicle invasion, type of seminal vesicle invasion, p53, Ki-67, p27, DNA ploidy status, lymph node status, and lymphovascular invasion; and

a processor, wherein said processor compares an identical set of factors determined from the patient diagnosed as having prostatic cancer to the correlation to predict the quantitative probability of recurrence of prostatic cancer in the patient following said identified therapy.

US 6,409,665 B1

APPARATUS FOR APPLYING IMPEDENCE MATCHING FLUID FOR ULTRASONIC IMAGING

Corey D. Scott, 1155 Northern Run, Stockbridge, Ga. 30281; Arlene K. Patrick, 503 Abington Way, Atlanta, Ga. 30328, and Michael R. Hicks, 5283 Moat Peher Dr., Mableton, Ga. 30126

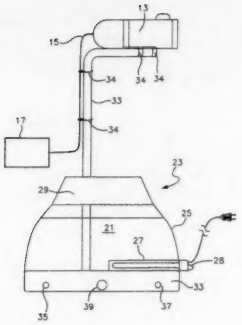
Filed Jun. 1, 2000, Appl. No. 585,164

Int. Cl. A61B *8/00*

U.S. Cl. 600—437 **9 Claims**

1. An apparatus for applying impedance matching gel to an ultrasonic transducer head of an imaging device for application to a patient, the apparatus comprising:

a reservoir for containing the impedance matching gel;



a heater for heating the impedance matching gel in the reservoir to a predetermined temperature;

a conduit for conveying the impedance matching gel from the reservoir to the ultrasonic transducer head;

a pumping arrangement for supplying the heated impedance matching gel from the reservoir, via the conduit, to the ultrasonic transducer head for application to the patient; and

a low gel sensing system for indicating when an amount of gel in the reservoir drops below a predetermined quantity to prevent overheating of the gel.

US 6,409,666 B1

TIP END OF ULTRASONIC ENDOSCOPE

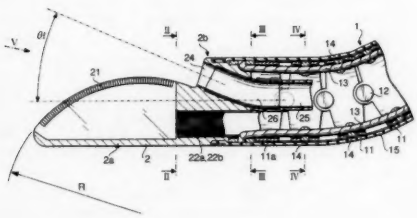
Keiji Ito, Saitama-ken, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 2000, Appl. No. 548,323

Claims priority, application Japan, Apr. 15, 1999, 11-108083; Apr. 15, 1999, 11-108084

Int. Cl. A61B *8/12*

U.S. Cl. 600—439 **10 Claims**



1. A tip end portion of an ultrasonic endoscope having a flexible insertion tube, a bendable portion being formed at a tip end portion of said insertion tube, said bendable portion being bendable in an arbitrary direction along a predetermined plane, a tip end main body provided with an ultrasonic scanning unit and an observation unit being connected to a tip end of said bendable portion, said tip end main body having a tip end side portion and a rear end side portion,

said tip end side portion of said main body being provided with a convex type ultrasonic probe for performing sector scanning with ultrasonic waves,

said rear end side portion of said main body being provided with:

an instrument outlet allowing a treatment instrument to protrude toward a forward-inclined direction, said outlet being located at a central portion on a cross section of said rear end side portion;

an observation window for viewing forward-inclined area which is directed to a forward side with respect to a scanning direction of said ultrasonic probe, said observation window being located on one side of said instrument outlet; and

an illumination window for emitting and illuminating an area to be observed through said observation window, said illumination window being located on the other side of said instrument outlet.

US 6,409,667 B1

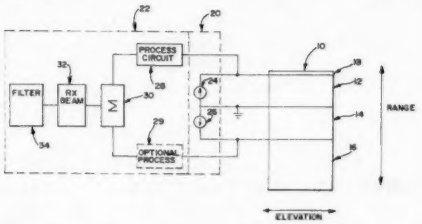
MEDICAL DIAGNOSTIC ULTRASOUND TRANSDUCER SYSTEM AND METHOD FOR HARMONIC IMAGING

John A. Hossack, Charlottesville, Va., assignor to Acuson Corporation, Mountain View, Calif.

Filed Feb. 23, 2000, Appl. No. 511,472

Int. Cl. A61B *8/00*

U.S. Cl. 600—443 **30 Claims**



1. A medical diagnostic ultrasound transducer system for harmonic imaging, the transducer system comprising:

at least one transducer element comprising first and second stacked layers;

a first path connected with the first layer;

a second path connected with the second layer, the first and second paths operable to independently process information during one of: a transmit event, a receive event and combinations thereof; and

a filter operable to pass information from the at least one transducer element that is at a harmonic of a fundamental transmit frequency and operable to filter information at the fundamental transmit frequency.

US 6,409,668 B1

DEVICE AND METHOD FOR EXAMINING FEMALE BREASTS USING ULTRASOUND

Helmut Wollschlaeger, Gabrielistrasse 9, 90480 Nuremberg, Germany

PCT No. PCT/DE99/01210, § 371 Date Dec. 18, 2000, § 102(e) Date Dec. 18, 2000, PCT Pub. No. WO99/55234, PCT Pub. Date Nov. 4, 1999

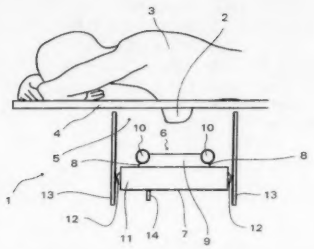
PCT Filed Apr. 22, 1999, Appl. No. 673,942

Claims priority, application Germany, Apr. 24, 1998, 198 18 226

Int. Cl. A61B *8/00*

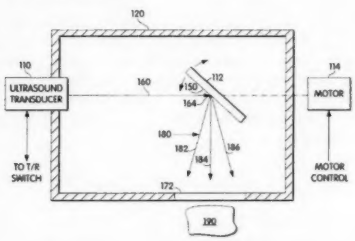
U.S. Cl. 600—443 **3 Claims**

1. A method for examining female breasts by means of ultrasound, for which an ultrasonic transducer is shifted by a transporting unit over a fixed path length between scanning positions for scanning flat layer areas in a stationary scanning position over at least one breast and a three-dimensional ultrasonic image is recorded and stored in an assigned memory unit by shifting consecutively while assigning a data value, corresponding to the respective shifting, to a layer image of an image sequence, the ultrasonic transducer being aligned at a tilting angle with respect to the at least one breast and the assigned tilting angle being stored and three-dimensional ultrasonic images being recorded and stored at least at two different tilting angles, wherein the coordinates of the ultrasonic images, recorded with different tilting angles, are imaged by means of a conversion program, taking into consideration the tilting angles, onto a common coordinate system and



compared with one another with a comparison program, direction-dependent structures in the respective three-dimensional ultrasonic images being determined by means of an evaluation program by scanning the image points in the vicinity of a fixed threshold value, compared by subtraction with projection onto the respective scanning direction and structures, occurring only in individual memory areas being discarded as artifacts.

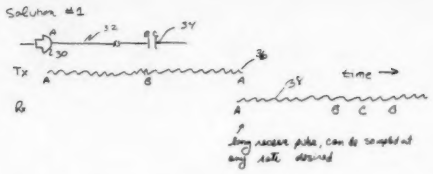
US 6,409,669 B1
ULTRASOUND TRANSDUCER ASSEMBLY INCORPORATING ACOUSTIC MIRROR
Richard A Hager, Derry, and David W Clark, Windham, both of N.H., assignors to Koninklijke Philips Electronics N.V., Eindhoven, Netherlands
Filed Feb. 24, 1999, Appl. No. 256,848
Int. Cl. A61B *8/00*
U.S. Cl. 600—447 **24 Claims**



1. An ultrasound transducer assembly comprising:
an acoustic mirror;
an ultrasound transducer that linearly scans an ultrasound beam across said acoustic mirror, wherein said scanned ultrasound beam is reflected by said acoustic mirror to form a reflected ultrasound beam that scans along a first direction; and
an actuating device for moving said acoustic mirror relative to said scanned ultrasound beam so as to adjust the scanning position of said reflected ultrasound beam along a second direction traverse to the first direction to scan a three-dimensional volume.

US 6,409,670 B1
HIGH SAMPLE RATE DOPPLER ULTRASOUND SYSTEM
Lin Xin Yao, and Gan Yao, both of Bellevue, Wash., assignors to Siemens Medical Solutions USA, Inc., Iselin, N.J.
Filed Apr. 27, 2000, Appl. No. 559,492
Int. Cl. A61B *8/06*
U.S. Cl. 600—453 **7 Claims**

1. A method of producing Doppler ultrasound data from an area of tissue defined by a range gate, comprising:
transmitting a Doppler pulse having a duration substantially equal to the time required for an ultrasonic sound wave to travel from a transducer to a top of a range gate and back;



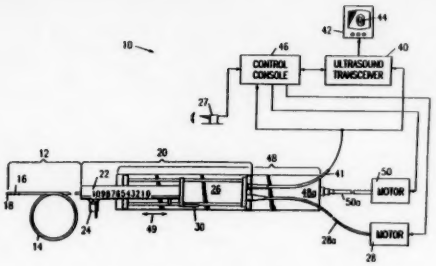
receiving echo signals created in response to the Doppler pulse transmitted;
sampling the received echo signals at a desired rate; and
using the sampled echo signals to analyze moving blood flow in the area of tissue defined by the range gate.

US 6,409,671 B1
ULTRASONOGRAPHY
Morten Eriksen, Oslo, and Sigmund Frigstad, Trondheim, both of Norway, assignors to Nycomed Imaging AS, Oslo, Norway
Continuation of application No. PCT/GB98/03809, filed on Dec. 17, 1998, Provisional application No. 60/071,713, filed on Jan. 16, 1998. This application Jun. 19, 2000, Appl. No. 597,726.
Claims priority, application United Kingdom, Dec. 18, 1997, 9726773
Int. Cl. A61B *8/00*
U.S. Cl. 600—458 **18 Claims**

1. A method for detecting local aberrations in the perfusion and/or compliance of vasculated tissue within a human or non-human animal subject pretreated with an intravascularly administered ultrasound contrast agent, said method comprising the steps:
i) generating a sequence of ultrasound image data in respect of a region of interest in said vasculated tissue;
ii) processing said data sequence to generate waveforms representative of arterial pulsatility; and
iii) analysing said waveforms for variations characteristic of local aberrations in tissue perfusion and/or compliance.

US 6,409,672 B2
AUTOMATED LONGITUDINAL POSITION TRANSLATOR FOR ULTRASONIC IMAGING PROBES, AND METHODS OF USING SAME
William E. Webler, Costa Mesa, and Mark S. Buhr, Newport Beach, both of Calif., assignors to Cardiovascular Imaging Systems, Inc., Sunnyvale, Calif.
Continuation of application No. 09/397,836, filed on Sep. 16, 1999, now Pat. No. 6,193,736, which is a continuation of application No. 09/040,058, filed on Mar. 17, 1998, now Pat. No. 6,013,030, which is a continuation of application No. 08/747,773, filed on Nov. 13, 1996, now Pat. No. 5,759,153, which is a continuation of application No. 08/573,507, filed on Dec. 12, 1995, now Pat. No. 5,592,942, which is a continuation of application No. 08/285,969, filed on Aug. 4, 1994, now Pat. No. 5,485,846, which is a continuation of application No. 07/906,311, filed on Jun. 30, 1992, now Pat. No. 5,361,768. This application Feb. 26, 2001, Appl. No. 794,543.
This patent is subject to a terminal disclaimer.
Int. Cl. A61B *8/12*
U.S. Cl. 600—463 **13 Claims**

1. A catheter system for detecting abnormalities within an anatomical structure of a patient, the system comprising:
a cable having proximal and distal ends, said cable comprising an imaging instrument coupled to a distal portion of said cable;
a position translator comprising a motor, said position translator in connection with the proximal end of said cable, wherein said position translator is adapted for manual linear translation of the cable relative to the catheter, and wherein said motor is



adapted to effect automatic motor-driven linear translation of the cable relative to the catheter.

US 6,409,673 B2

METHOD AND APPARATUS FOR INTRAVASCULAR TWO-DIMENSIONAL ULTRASONOGRAPHY

Paul G. Yock, Hillsborough, Calif., assignor to Cardiovasular Imaging Systems, Inc., Sunnyvale, Calif.

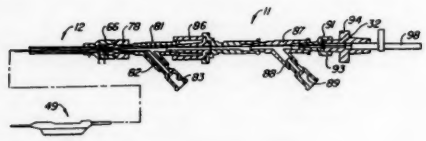
Continuation of application No. 09/300,168, filed on Apr. 27, 1999, now Pat. No. 6,221,015, which is a continuation of application No. 08/911,635, filed on Aug. 15, 1997, now Pat. No. 5,902,245, which is a continuation of application No. 08/467,178, filed on Jun. 6, 1995, now Pat. No. 5,865,178, which is a continuation of application No. 08/162,412, filed on Dec. 3, 1993, now Pat. No. 5,676,151, which is a division of application No. 08/014,906, filed on Feb. 1, 1993, now Pat. No. 5,313,949, which is a continuation of application No. 07/826,260, filed on Jan. 24, 1992, now abandoned, which is a continuation of application No. 07/649,048, filed on Feb. 1, 1991, now abandoned, which is a continuation of application No. 07/290,533, filed on Dec. 23, 1988, now Pat. No. 5,000,185, which is a continuation-in-part of application No. 06/834,893, filed on Feb. 28, 1986, now Pat. No. 4,794,931.

This application Mar. 23, 2001, Appl. No. 816,586.

This patent is subject to a terminal disclaimer.

Int. Cl. A61B *8/12*

U.S. Cl. 600—463 **28 Claims**



1. A method of imaging and treating a region of a blood vessel using a catheter, said method comprising:

advancing a catheter body having a distal region and an imaging device disposed at the distal region into the blood vessel until the imaging device is located in a region to be treated, the imaging device having a moving reflector;

generating an image of the region to be treated by moving the imaging device within and relative to the catheter body and reflecting an imaging signal off the moving reflector of the imaging device; and

inflating a balloon disposed at the distal region of the catheter body such that the wall of the balloon contacts a partial or full occlusion in the blood vessel to apply a force to the occlusion to treat the region of the blood vessel.

US 6,409,674 B1

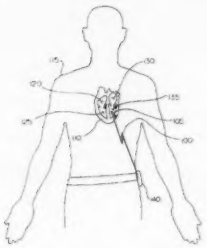
IMPLANTABLE SENSOR WITH WIRELESS COMMUNICATION

Brian P. Brockway, Shoreview; Perry Alton Mills, Arden Hills, and Lynn M. Zwiers, Lino Lakes, all of Minn., assignors to Data Sciences International, Inc., St. Paul, Minn.

Filed Sep. 24, 1998, Appl. No. 159,653

Int. Cl. A61B *5/00*

U.S. Cl. 600—486 **33 Claims**



1. An apparatus for measuring a blood pressure in a heart chamber in a heart in a living organism, the apparatus comprising:

a housing adapted for being disposed in the heart;

a pressure transducer, adapted for being disposed in the heart, the pressure transducer providing a pressure signal based on the blood pressure in the heart chamber;

a wireless communication circuit, carried by the housing and coupled to the pressure transducer, the communication circuit wirelessly transmitting pressure information out of the heart based on the pressure signal;

at least one stabilizer, coupled to the housing, and adapted for stabilizing the housing within the heart; and

a pressure transmission catheter adapted for receiving the pressure in the heart chamber, the pressure transmission catheter being coupled to the pressure transducer via a flowable medium to communicate the pressure in the heart chamber to the pressure transducer.

US 6,409,675 B1

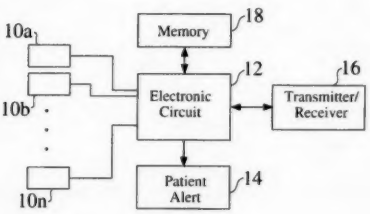
EXTRAVASCULAR HEMODYNAMIC MONITOR

Robert Turcott, Menlo Park, Calif., assignor to Pacesetter, Inc., Sunnyvale, Calif.

Filed Nov. 10, 1999, Appl. No. 438,017

Int. Cl. A61B *5/04*

U.S. Cl. 600—508 **27 Claims**



1. An implantable medical device for monitoring the hemodynamic status of a patient comprising:

a lung sound sensor for extravascular implantation; and

electronic circuitry coupled to said sensor for processing an output of said sensor and for providing an indication of hemodynamic status of said patient;

wherein said lung sound sensor and said electronic circuit detect pulmonary rales.

US 6,409,676 B2

PROCESS FOR DETERMINING RESPIRATORY PHASES OF THE SLEEP OF A USER

Stéphane Ruton, Viroflay, and Benoit Jonquet, Palaiseau, both of France, assignors to Taema, Antony Cedex, France

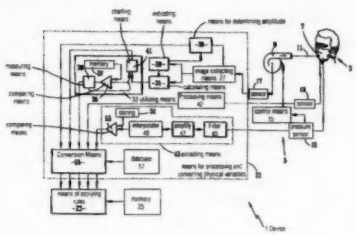
Division of application No. 09/335,724, filed on Jun. 18, 1999, now Pat. No. 6,190,328. This application Dec. 11, 2000, Appl. No. 732,873.

Claims priority, application France, Jun. 18, 1998, 98 07695

This patent is subject to a terminal disclaimer.

Int. Cl. A61B *5/08*

U.S. Cl. 600—532 14 Claims



1. A process for determining respiratory phases of the sleep of a user, comprising:

measuring at least two physical variables of which at least a first physical variable is representative of the nasal flow of the user, and of which at least a second physical variable is representative of the user's buccal flow;

processing and converting each physical variable with a view to establishing its degree of membership in at least one state of a fuzzy variable; and

applying pre-established rules between at least one state of a first fuzzy variable and a state of a second fuzzy variable so as to evaluate the degree of membership in a respiratory phase state of the sleep of the user according to fuzzy logic.

US 6,409,677 B1

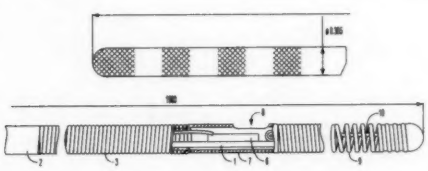
METHOD FOR TEMPERATURE COMPENSATION IN A COMBINED PRESSURE AND TEMPERATURE SENSOR

Sauli Tulkki, Uppsala, Sweden, assignor to Radi Medical Systems AB, Uppsala, Sweden

Provisional application No. 60/136,401, filed on May 27, 1999. This application May 25, 2000, Appl. No. 577,663.

Int. Cl. A61B *5/00*

U.S. Cl. 600—561 26 Claims



1. A method of selectively measuring at least one of pressure and temperature in vivo, comprising the steps of:

providing a pressure sensor having two piezoresistive elements, said piezoresistive elements being coupled to a control unit by cables having a temperature dependence affecting a signal obtained from said piezoresistive elements;

providing excitation to said sensor to yield two different signals therefrom, such that at least a component of at least one of said signals is representative of cable resistance; and

using said component representative of the cable resistance to compensate for the influence of said cable resistance on at least one of temperature and pressure signals.

US 6,409,678 B1

ENDOSCOPIC BIOPSY FORCEPS

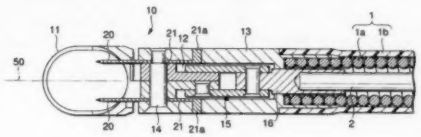
Teruo Ouchi, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 2000, Appl. No. 519,854

Claims priority, application Japan, Apr. 14, 1999, 11-106570

Int. Cl. A61B *10/00*

U.S. Cl. 600—562 14 Claims



1. Endoscopic biopsy forceps comprising:

a sheath;

a manipulating wire extending through the sheath;

a pair of forceps cups provided at a distal end of the sheath and configured to open and close by advancing and retracting the manipulating wire along a longitudinal axis; and

at least one positioning projection commencing at the distal end of the sheath and extending forward to project through the pair of forceps cups, the positioning projection being offset from a center of the pair of forceps cups and configured to pierce a specimen to positionally secure the forceps.

US 6,409,679 B2

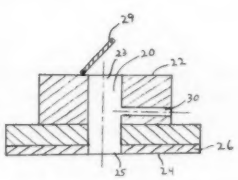
APPARATUS AND METHOD FOR COLLECTING BODILY FLUID

Richard Sung Hak Pyo, Irvine, Calif., assignor to Pacific Paragon Investment Fund Ltd., Vancouver, Canada

Provisional application No. 60/211,204, filed on Jun. 13, 2000. This application Jun. 12, 2001, Appl. No. 879,729.

Int. Cl. A61B *5/00*

U.S. Cl. 600—573 14 Claims



1. An apparatus for external application onto a skin of a user, said apparatus comprising:

a module having a top surface and a bottom surface, said module defining a primary hole extending from said top surface to said lower surface, said hole defining a first opening at said top surface and a second opening at said bottom surface;

said module further having a lower edge and an outer surface;

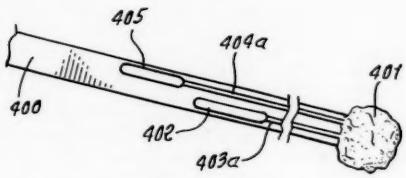
a base member extending radially for a predetermined radius from said lower edge of said module;

a removeable lid disposed on said top surface of said module covering said first opening; and,

a bore extending from said outer surface of said module into said primary hole;

wherein said bottom surface of said module is placed on the surface of the skin of said user and a skin blister is created into said primary hole by creating a vacuum within said primary hole by drawing air out through said bore.

US 6,409,680 B1
PH MEASUREMENT OF BODY FLUID
James C. Caillouette, 685 Oak Knoll Cir., Pasadena, Calif. 91106
Continuation-in-part of application No. 08/862,032, filed on May 22, 1997, now Pat. No. 5,928,165, which is a continuation-in-part of application No. 08/810,347, filed on Mar. 3, 1997, now Pat. No. 5,738,634, which is a continuation-in-part of application No. 08/376,830, filed on Jan. 23, 1995, now Pat. No. 5,664,579, which is a continuation-in-part of application No. 08/295,399, filed on Aug. 25, 1994, now Pat. No. 5,425,377. This application May 10, 1999, Appl. No. 307,478.
Int. Cl. A61B *5/00*
U.S. Cl. 600—584 **25 Claims**



1. In apparatus to test for presence of pathogenic bacteria, in body moisture, the combination comprising:

a) a carrier,

b) a moisture receiver on the carrier that may carry an amine produced by the bacteria,

c) said receiver adapted to receive a reactant or reactants to produce a color change if the amine is thereby contacted by the reactant or reactants,

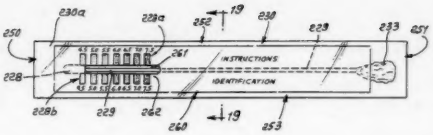
d) and providing at least one deformable container on the carrier containing said reactant or reactants, whereby the container or containers may be deformed to release said reactant or reactants for contact with moisture in or on the receiver,

e) and wherein there are two of said deformable containers on the carrier, one containing said one reactant and the other container containing another of the reactants,

f) and wherein said receiver is carried to receive application of the reactants from the containers.

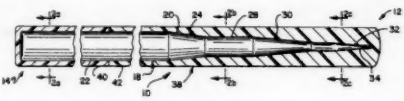
US 6,409,681 B1
ESTROGEN OR ESTRADIOL NEED DETERMINATION BY VAGINAL OR URETHRAL ACIDITY DETERMINATION
James C. Caillouette, 685 Oak Knoll Cir., Pasadena, Calif. 91106
Division of application No. 09/258,381, filed on Feb. 26, 1999, now Pat. No. 6,283,927, which is a division of application No. 08/890,748, filed on Jul. 11, 1999, now Pat. No. 5,916,176, which is a continuation-in-part of application No. 08/699,251, filed on Aug. 19, 1996, now Pat. No. 5,735,801, which is a continuation-in-part of application No. 08/570,534, filed on Dec. 11, 1995, now Pat. No. 5,762,614, which is a continuation-in-part of application No. 08/537,379, filed on Oct. 27, 1995, now Pat. No. 5,577,512, which is a continuation-in-part of application No. 08/376,830, filed on Jan. 23, 1995, now Pat. No. 5,664,579, which is a continuation-in-part of application No. 08/295,399, filed on Aug. 25, 1994, now Pat. No. 5,425,377. This application Apr. 21, 2000, Appl. No. 556,747.
Int. Cl. A61B *5/00*
U.S. Cl. 600—584 **11 Claims**

1. The combination that comprises a package including an elongated carrier, a pH indicating detector on the carrier, color comparison measurement elements, said package also including a longitudinally elongated receptacle for said detector, said color comparison elements positioned in association with the receptacle,



there being a longitudinal window along which said color comparison elements are displayed, whereby the detector may be manipulated within the receptacle and along the window for visual color comparison with said elements, after exposure of the detector to vaginal or urethral moisture.

US 6,409,682 B1
INTRAVASCULAR GUIDE WIRE AND METHOD FOR MANUFACTURE THEREOF
Paul H. Burmeister, White Bear Lake; Richard E. Cappetta, Plymouth; Steven S. Hackett, Minnetonka, and Paul Slaikeu, Vadnais Heights, all of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.
Continuation of application No. 08/534,113, filed on Sep. 26, 1995, now abandoned, which is a continuation of application No. 08/319,772, filed on Oct. 7, 1994, now Pat. No. 5,452,726, which is a continuation of application No. 08/034,174, filed on Mar. 12, 1993, now abandoned, which is a continuation of application No. 07/716,678, filed on Jun. 18, 1991, now abandoned. This application Jun. 24, 1997, Appl. No. 881,586.
Int. Cl. A61B *5/00*
U.S. Cl. 600—585 **12 Claims**

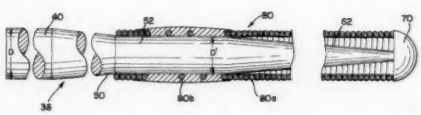


1. A guide wire comprising:

an elongated core having a length, a width, and an axial surface defined thereby extending the length of said elongated core; and

a plastic jacket extending around said axial surface of said elongated core, said plastic jacket including a proximal jacket portion and a distal jacket portion, said jacket portions formed of a plastic material, wherein said distal jacket portion includes means for enhancing the radiopaque properties of said distal jacket portion relative to said proximal jacket portion incorporated within said distal jacket portion.

US 6,409,683 B1
MEDICAL GUIDEWIRE WITH IMPROVED COIL ATTACHMENT
Dennis J. Fonseca, Miami, and Brian G. Gore, Orlando, both of Fla., assignors to Cordis Corporation, Miami Lakes, Fla.
Provisional application No. 60/102,446, filed on Sep. 30, 1998. This application Sep. 21, 1999, Appl. No. 399,710.
Int. Cl. A61B *5/00*
U.S. Cl. 600—585 **4 Claims**



1. A medical guidewire comprising:

an elongated corewire having proximal and distal ends and having a first, uniform diameter proximal portion and a second flexible, reduced diameter distal portion;

a coiled wire spring having distal and proximal ends and including a distal portion comprised of tightly spaced coil turns and a proximal portion comprised of loosely spaced coil turns, said coiled wire spring is formed of a wire having a cylindrical cross section of a predetermined diameter and in which adjacent turns of the loosely spaced coil turns are spaced apart at least five times the diameter of the wire in the coiled wire spring;

bonding means for attaching the distal end of the coiled wire spring to the distal end of the corewire; and,

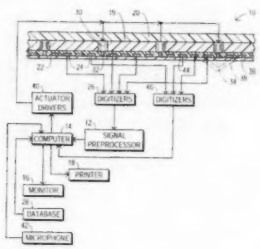
bonding means for attaching the entire portion of the coiled wire spring comprised of the loosely spaced coil turns to the uniform diameter portion of the corewire.

US 6,409,684 B1

MEDICAL DIAGNOSTIC DEVICE WITH MULTIPLE SENSORS ON A FLEXIBLE SUBSTRATE AND ASSOCIATED METHODOLOGY

Peter J. Wilk, 185 W. End Ave.-Unit 22M, New York, N.Y. 10023

Filed Apr. 19, 2000, Appl. No. 552,102
Int. Cl. A61B *7/00*
U.S. Cl. 600—586 **34 Claims**



1. A medical diagnostic device comprising:

a substrate or carrier;

a plurality of acoustoelectric transducers attached to said substrate or carrier in a pre-established array; and

diagnosis means operatively coupled to said transducers for automatically analyzing signals from said tranducers to automatically determine an internal condition of a patient, further comprising;

a plurality of mechanical probes movably mounted to said substrate or carrier; and

actuators operatively connected to said probes for inducing movement of said probes, in a direction substantially perpindicular to said substrate or carrier, from nascent or retracted positions to extended positions.

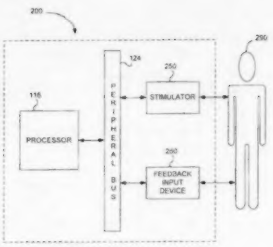
US 6,409,685 B1

METHOD FOR IMPROVING MOTOR CONTROL IN AN INDIVIDUAL BY SENSORY TRAINING

Michael Mathias Merzenich, San Francisco; Nancy N. Byl, Oakland, and William M. Jenkins, Pacifica, all of Calif., assignors to Scientific Learning Corporation, Oakland, Calif.

Continuation of application No. 08/970,339, filed on Nov. 14, 1997, now abandoned. This application Mar. 21, 2000, Appl. No. 470,047.
Int. Cl. A61B *5/103;5/117*
U.S. Cl. 600—587 **33 Claims**

1. A method for improving motor control of a portion of an individual with impaired motor control, the method using a system



having a processor, a stimulator and an input device, the stimulator operatively coupled to the portion, the method comprising:

a) selecting a first and second location from a plurality of locations within the portion, wherein the individual may have difficulty sensing differentially between the first and second locations;

b) differentially stimulating said first and second location using the stimulator;

c) receiving feedback from the individual via the input device, the feedback indicating the degree of difficulty the individual has in sensing differentially between the first and second locations; and

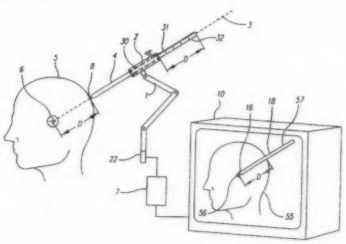
d) adaptively repeating b by varying the stimuli based on the feedback from c, wherein the stimuli are adapted based on the feedback from the individual to improve sensing between the first and second locations.

US 6,409,686 B1

VIRTUAL PROBE FOR A STEREOTACTIC DIGITIZER FOR USE IN SURGERY

Barton L. Guthrie, Birmingham, Ala., and Robert A. Daniels, Haverhill, Mass., assignors to Sherwood Services AG, Shaffhausen, Switzerland

Continuation of application No. 08/847,308, filed on Apr. 24, 1997, now Pat. No. 6,120,465, which is a continuation of application No. 08/521,908, filed on Aug. 31, 1995, now abandoned, which is a continuation of application No. 08/185,716, filed on Jan. 24, 1994, now abandoned. This application Apr. 14, 2000, Appl. No. 549,752.
This patent is subject to a terminal disclaimer.
Int. Cl. A61B *5/00*
U.S. Cl. 600—587 **12 Claims**



1. Apparatus for determining probe depths within a human body by means of computer graphic assisted stereotaxy, comprising:

a probe adapter;

a slide probe adapted to be coupled to and slide with respect to said probe adapter along a line parallel to a probe direction defined by said probe adapter, said slide probe having a slide probe tip which is adapted to contact portions of said anatomy;

readout means cooperatively coupled to said slide probe to provide a distance readout corresponding to the distance of said slide probe tip with respect to said probe adapter;

a freehand three-dimensional digitizer coupled to said probe adapter, said digitizer adapted to provide position data corre-

sponding to said probe direction and a predetermined probe tip position and corresponding to a position of said slide probe tip relative to said probe adapter, said position data further being defined with respect to the anatomy of a patient when said three-dimensional digitizer is calibrated in position relative to said anatomy;

computing means in communication with said three-dimensional digitizer, said computing means configured to

(i) display on display means said position of said slide probe tip relative to said probe adapter and said probe direction in relation to said anatomy; and

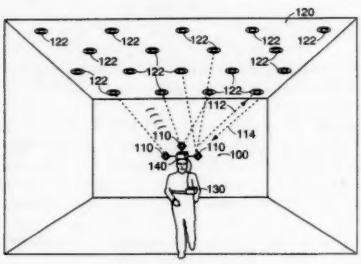
(ii) accept scanner image data of said anatomy;

whereby in use when said three-dimensional digitizer is near said anatomy, said probe direction and said probe tip can be moved to a desired position relative to said anatomy and a desired target in said anatomy as represented on said display means, and said distance readout of said readout means can be a gauge of the depth from said slide probe tip to said target when said slide probe tip contacts a part of said anatomy.

US 6,409,687 B1
MOTION TRACKING SYSTEM

Eric M. Foxlin, Arlington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of application No. 09/062,442, filed on Apr. 17, 1998, now Pat. No. 6,176,837. This application Jul. 5, 2000, Appl. No. 609,424.
This patent is subject to a terminal disclaimer.
Int. Cl. A61B *5/103*
U.S. Cl. 600—595 **22 Claims**



1. A method for tracking motion of a body in an environment comprising:

disposing reference devices in the environment;

measuring a range between a first of the reference devices in the reference devices and each of one or more sensors mounted on the body, including receiving at said sensors a range measurement signal transmitted from the first of the reference devices;

predicting a range between the first of the reference devices and each of said sensors;

updating an orientation estimate of the body based on the measured and the predicted ranges; and

updating the orientation estimate based on an inertial measurement of the body, including obtaining an inertial measurement from an angular inertial sensor coupled to the body.

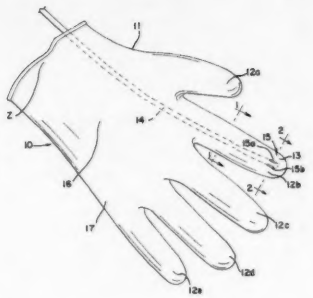
US 6,409,688 B1
RECTAL GLOVE

Bradley R. Hennenfent, 454 Summer Dr. NE., Atlanta, Ga. 30328

Filed Nov. 15, 1999, Appl. No. 439,447
Int. Cl. A61H *1/00*
U.S. Cl. 601—18 **14 Claims**

1. A substance communication device comprising:

a fingered glove defining a pocket for receiving a wearer's hand;



said glove having an aperture at a desired point wherein said desired point is a contact point between said glove and a treatment site;

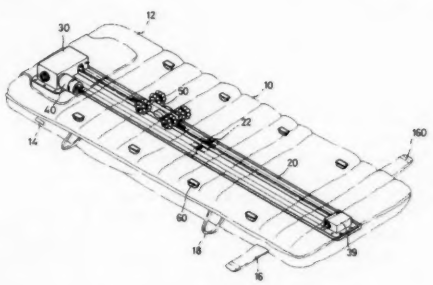
a substance reservoir having a volume permitting containment of a medicament; and

said substance reservoir connected to said glove by a substance transportation channel having a front end terminating at said desired point and having a back end terminating at said substance reservoir.

US 6,409,689 B1
FOLDABLE MASSAGING MATTRESS

Peter Chen, Room 4C-23, No. 5, Sec. 5, Sinyi Rd., Taipei, Taiwan

Filed Oct. 23, 2000, Appl. No. 694,601
Int. Cl. A61H *15/00*
U.S. Cl. 601—99 **12 Claims**



1. A foldable massaging mattress comprising:

a mattress body (**10**) having a first end and a second end, and a protruding pillow portion (**12**) at said first end thereof;

a track (**20**) having a first end and a second end, said track (**20**) being arranged in said mattress body (**10**) and extending in the longitudinal midway of said mattress body (**10**), said track (**20**) having at least two sections pivotally connected with each other;

a gear case (**30**) arranged in said protruding pillow portion (**12**) of said mattress body (**10**) in a location adjacent to said first end of said track (**20**);

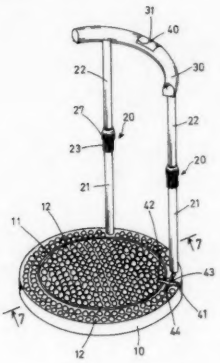
a sprocket case (**39**) arranged in said mattress body (**10**) in a location adjacent to said second end of said track (**20**);

a DC motor (**40**) for driving said gear case (**30**);

a carriage (**50**) having first and second opposed ends and movable along said track (**20**); and

a chain (**26**) running between said gear and sprocket cases (**30**, **39**) and having two ends respectively attached to said opposed two ends of said carriage (**50**), said chain (**26**) being driven by said gear case (**30**).

US 6,409,690 B1
MASSAGE DEVICE FOR FEET
Sherry Chen, P.O. Box 63-99, Taichung 406, Taiwan
Filed Feb. 14, 2001, Appl. No. 784,880
Int. Cl. A61H *15/00*
U.S. Cl. 601—126 **15 Claims**



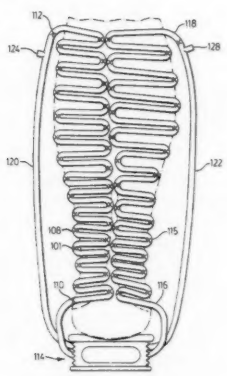
1. A massage device for massaging feet of user, said massage device comprising:

a base including an upper portion, said base including an outer peripheral portion having a plurality of massage projections extended upward therefrom for engaging with and for massaging the feet of the user,

a rotary member rotatably supported on said upper portion of said base and including an upper portion having a plurality of massage projections extended upward therefrom for engaging with and for massaging the feet of the user, and

a handle supported above said base for supporting an upper portion of the user.

US 6,409,691 B1
LIQUID BRACE
Edward B. Dakin, Lindsay, and S. Adam Hacking, Montreal, both of Canada, assignors to Daos Limited, Canada
Filed Aug. 2, 1999, Appl. No. 366,344
Int. Cl. A61F *5/00*
U.S. Cl. 602—5 **24 Claims**

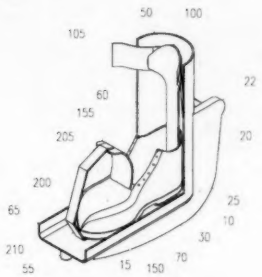


1. A brace for supporting an injured body part of wearer, comprising:

at least one flexible compression bag containing a liquid;

a plurality of valves, each valve having a first open position and a second closed position, said valves segmenting said at least one compression bag into serially arranged bag sections and arranged to provide liquid flow in a controlled manner through said at least one compression bag.

US 6,409,692 B1
ANKLE FOOT ORTHOSIS DONNING DEVICE
Ann Marie Covey, 800 kennebec Rd., Hampden, Me. 04444
Filed Sep. 9, 2000, Appl. No. 658,526
Int. Cl. A61F *5/00*
U.S. Cl. 602—5 **17 Claims**



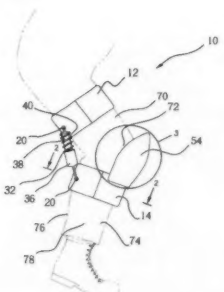
1. An ankle foot orthosis donning device comprising:

an L-shaped channel having a vertical calf portion and a forwardly extending horizontal foot portion joined to said calf portion at a joint;

at least one rocker disposed proximally to said joint and extending rearwardly therefrom, said rocker comprising a convexly arcuate cylindrical rail contoured to act as a cam to allow substantially smooth rotation of said L-shaped channel into an inclined position when tilted; and

wherein said foot portion is sufficiently weighted to bias said device to an upright position.

US 6,409,693 B1
LEG SUPPORT DEVICE
Robert J. Brannigan, P.O. Box #286, Pequannock, N.J. 07440
Filed Jan. 22, 2001, Appl. No. 765,459
Int. Cl. A61F *5/00*
U.S. Cl. 602—16 **9 Claims**



1. A leg brace device, said device being positionable on a leg of a user, the device being removably securable above and below a knee portion of the leg, said leg having a front side, a back side and a pair of lateral sides, said device comprising:

a pair of coupling members for positioning around the leg, wherein a first of said coupling members is positionable on the leg above the knee and a second of said coupling members is positionable below the knee; and

a pair of biasing members for biasing said first coupling member away from said second coupling member, each of said biasing members being securely attached to and extending between one of said first and second coupling members such that each of said biasing members is positioned adjacent to one of said lateral sides of said leg when said coupling members are positioned on said leg;

wherein each of said coupling members comprises:

an annular member having a break therein such that a pair of free ends of said annular are defined, said annular member having an inner surface and an outer surface, said annular member comprising a resiliently flexible material;

a panel being securely attached to and substantially covering said inner surface of said annular member, said panel comprising an elastomeric material;

each of a pair of brackets being integrally coupled to and extending outwardly away from said outer surface of said annular member, said brackets being generally positioned opposite of each other such that each of the brackets extends outwardly from said lateral sides of said leg;

each of said biasing members being securely attached to and extending between one of said brackets on said first and second coupling members; and

a securing means for selectively closing said break in said annular member.

US 6,409,694 B1

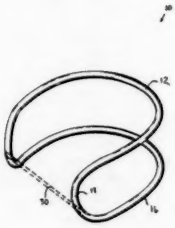
NECK BRACE

Carlito V. Bugarin, 9547 2nd Ave. NW., Seattle, Wash. 98117, assignor to Carlito V. Bugarin, Seattle, Wash.

Filed Jun. 23, 2000, Appl. No. 602,296

Int. Cl. A61F *5/00*

U.S. Cl. 602—18 **22 Claims**



1. A neck brace comprising:

a substantially U-shaped elongate neck support section that defines an open front portion;

a substantially U-shaped elongate shoulder rest that can support the elongate neck support section; and

a transition section that connects the neck support section to the shoulder rest.

US 6,409,695 B1

ANKLE-FOOT ORTHOTIC

John D. Connelly, 3155 Werkridge Dr., Cincinnati, Ohio 45248

Filed Jul. 27, 1999, Appl. No. 362,274

Int. Cl. A61F *5/00*

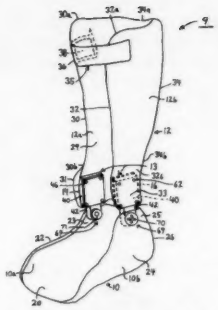
U.S. Cl. 602—27 **6 Claims**

1. An ankle-foot orthotic for restricting inversion and eversion of the foot while allowing plantarflexion and dorsiflexion of the foot and permitting translational movement of said ankle-foot orthotic comprising:

a foot shell;

a lower leg shell; and

a hinging means pivotally attaching said foot shell to said lower leg shell, said hinging means providing rotational and translational movement to, and restricting sideways bending movement of, said foot shell relative to said lower leg shell, said hinging means comprising a lateral mechanical joint and a medial mechanical joint, said lateral mechanical joint and said medial mechanical joint each comprising:



a housing, said housing including a hollow interior, an open face, a solid face and a partially open end, said partially open end having an opening through said partially open end;

a slider having an upper end and a lower end, said slider being rigid, said slider being positioned freely inside of said hollow interior of said housing, said lower end of said slider projecting through and outside of said opening of said partially open end of said housing, said upper end of said slider being larger than said opening of said open end of said housing but smaller than said hollow interior of said housing allowing translational movement of said slider inside of said hollow interior of said housing while restricting sideways movement of said slider inside of said hollow interior of said housing and preventing removal of said slider through said opening of said partially open end of said housing;

a cover affixed to said open face of said housing;

a spring means placed inside of said hollow interior of said housing, said spring means providing cushioning for said slider while allowing said slider to return to a neutral position inside of said hollow interior of said housing; and

a pivoting means attached to said lower end of said slider.

US 6,409,696 B1

EXTRACORPOREAL BLOOD PROCESSING METHODS AND APPARATUS

Coy Toavs, Lafayette; John J. Kappus, Denver; Mark J. Brierton, Littleton; David R. Shouldice, Lakewood, and Jeffrey J. Blakeslee, Arvada, all of Colo., assignors to Gambro, Inc., Lakewood, Colo.

Division of application No. 08/476,542, filed on Jun. 7, 1995, now Pat. No. 5,674,644. This application Oct. 10, 1997, Appl. No. 949,041.

Int. Cl. A61M *37/00;5/178;* **C02F** *9/00;1/38*

U.S. Cl. 604—6.01 **9 Claims**

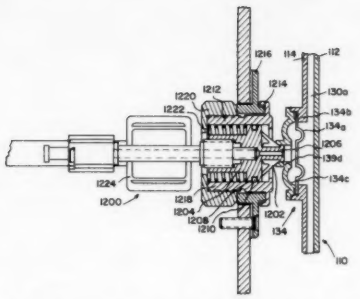
1. A device for extracorporeal blood processing, comprising:

a molded cassette member having:

an integral internal fluid passageway in direct fluid communication with both a blood removal conduit means for transferring whole blood from a donor and a blood return conduit means for transferring uncollected blood components to a donor; and

a diaphragm member having an internal-facing side in fluid communication with said internal integral passageway and an external-facing side being externally accessible, said diaphragm member being positionally responsive to pressure changes in said blood removal conduit means and blood return conduit means; and

a pressure-sensing means positionable relative to said cassette member for air coupling with said external-facing side of said



diaphragm member of said molded cassette member and for providing an output signal responsive to said pressure changes;

wherein one of said cassette member and said pressure-sensing means comprises an extending portion and the other one of said cassette member and pressure-sensing means comprises a receiving portion, said extending portion and receiving portion being provided for mating engagement with each other to establish said air coupling between said diaphragm and said pressure-sensing means.

US 6,409,697 B2

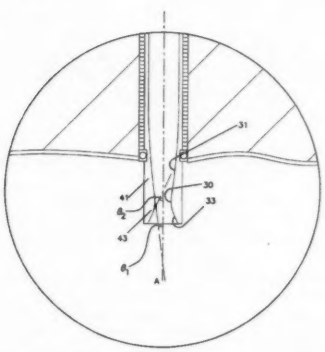
TRANSMYOCARDIAL IMPLANT WITH FORWARD FLOW BIAS

Robert A. Eno, Plymouth, and Guy P. Vanney, Blaine, both of Minn., assignors to HeartStent Corporation, St. Paul, Minn.

Filed May 4, 1999, Appl. No. 304,730

Int. Cl. A61M *5/00;25/00;* **A61F** *2/06;* **A61B** *17/08*

U.S. Cl. 604—9 **14 Claims**



1. A transmyocardial implant for establishing a blood flow path through a heart wall between a heart chamber and a lumen of a coronary vessel at said heart wall, said implant comprising:

a hollow conduit having an open first end and an open second end, said conduit sized to extend at least from said vessel through said heart wall and to said chamber, said conduit having a conduit wall defining a blood flow pathway within an interior of said conduit between said first and second ends;

said first and second ends mutually positioned for said first end to reside within said vessel and unobstructively opposing a wall of said vessel when said conduit is placed within said heart wall with said second end positioned at said chamber;

said conduit wall formed of a material sufficiently rigid to resist deformation and closure of said pathway in response to contraction of said heart wall;

a flow restriction formed in said pathway for reducing a discharge velocity of blood flow discharged from said first end, said flow restriction including a permanent, non-varying narrowing of said conduit within said pathway and between said first and second ends to define a permanent, non-varying restricted flow region spaced at an intermediate location between said first and second ends; and

the conduit wall defining a first inner diameter transition extending from a region of maximum restriction towards said first end and a second inner diameter transition extending from said region of maximum restriction towards said second end; said first inner diameter transition defining a smaller angle of transition relative to a central reference axis than said second inner diameter transition.

US 6,409,698 B1

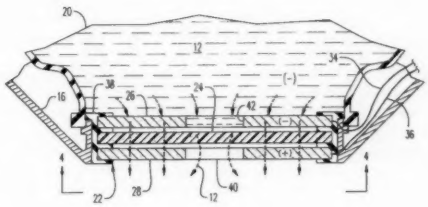
PERFORATE ELECTRODIFFUSION PUMP

John N. Robinson, 2165 Chardonnay Cir., Gibsonia, Pa. 15044; Paul F. Burke, Bellingham, and Kenneth A. Fine, Sharon, both of Mass., assignors to John N. Robinson, Gibsonia, Pa.

Filed Nov. 27, 2000, Appl. No. 723,057

Int. Cl. R01D *57/02;* **A61N** *1/30*

U.S. Cl. 604—19 **22 Claims**



1. An electrodiffusion pump for dispensing an ionic drug comprising:

a housing having an inlet for receiving said drug, a reservoir for storing said drug, and an outlet for discharging said drug;

a diffusion membrane disposed in flow communication between said reservoir and outlet for diffusing said drug outwardly therethrough;

an internal electrode disposed inside said reservoir along an internal side of said membrane;

an external electrode disposed outside said reservoir along an external side of said membrane;

said internal and external electrodes being porous for channeling said drug therethrough, and said external electrode further being perforate to expose a portion of said membrane at said outlet; and

means for electrically powering said electrodes as cathode and anode for additionally driving said ionic drug through said membrane under electrophoresis.

US 6,409,699 B1

CONTINUOUS FLOW-THROUGH PERITONEAL DIALYSIS (CFPD) METHOD WITH CONTROL OF INTRAPERITONEAL PRESSURE

Stephen R. Ash, Lafayette, Ind., assignor to Renal Solutions, Inc., West Lafayette, Ind.

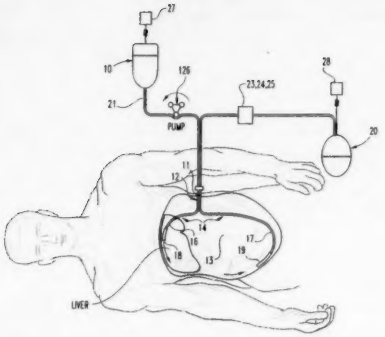
PCT No. PCT/US97/19489, § 371 Date Jun. 28, 1999, § 102(e) Date Jun. 28, 1999, PCT Pub. No. WO98/17333, PCT Pub. Date Apr. 30, 1998

Provisional application No. 60/029,062, filed on Oct. 22, 1996. This PCT application Oct. 22, 1997, Appl. No. 284,904.

Int. Cl. A61M *1/00*

U.S. Cl. 604—29 **41 Claims**

1. A device for performing continuous flow peritoneal dialysis, comprising:



a dialysate source;

a peritoneal fluid receptacle;

a flexible catheter having a first segment comprising a conduit which defines a first lumen and a second lumen, and a second segment comprising a first limb which defines a recess in fluid communication with the first lumen and a second limb which defines a recess in fluid communication with the second lumen, the first and second limbs being formed to move independently of one another and having distal ends opposite the first segment;

a first tube in fluid communication with the dialysate source and the first lumen;

a second tube in fluid communication with the second lumen and the peritoneal fluid receptacle; and

a pressure regulator in fluid communication with the second tube;

wherein the pressure regulator is formed to prevent fluid flow therethrough when the fluid in the second tube has a pressure less than a predetermined threshold pressure and to pass fluid therethrough when the fluid in the second tube has a pressure at least as great as the predetermined threshold pressure; and

wherein the predetermined threshold pressure is a pressure of from about 6 to about 20 mm Hg.

US 6,409,700 B1

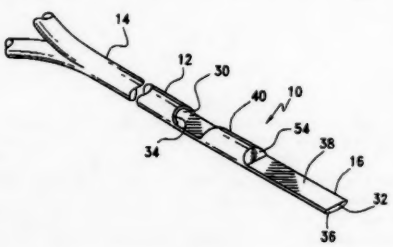
DOUBLE LUMEN CATHETER

John M. Siegel, Jr., Huntsville; Vinod B. Makhijani, Madison; Ming Lei, Huntsville, and Jagannath Raghavan, Madison, all of Ala., assignors to CFD Research Corporation, Huntsville, Ala.

Filed Mar. 22, 1999, Appl. No. 273,571

Int. Cl. A61M *3/00*

U.S. Cl. 604—43 **25 Claims**



1. A double lumen catheter comprising an elongated tube having unitary outer walls and a longitudinal planar septum dividing an interior of said tube into an inlet lumen defined by an outer wall and said septum and a longer return lumen, said inlet lumen extending from a proximal end of said tube to an end terminating in a distally forward facing aperture that terminates said outer wall of said inlet lumen to form a wall-less open spacing defined solely by said septum, said return lumen extending substantially contiguously with said inlet lumen from said proximal end of said tube to an end terminating in a distally forward facing aperture spaced in the longitudinal direction distally forward of said inlet lumen aperture, wherein said inlet lumen aperture is defined by an outer wall lip that tapers away from said septum in a proximal direction and said return is defined by an outer wall lip that tapers away from said septum in a proximal direction and a diverting structure extending from said outer wall of said return lumen and positioned distally forward of said aperture of said inlet lumen and said spacing and noncontiguous to said aperture to divert flow of treated fluid discharged from said return lumen away from said distally forward facing aperture of said inlet lumen.

US 6,409,701 B1

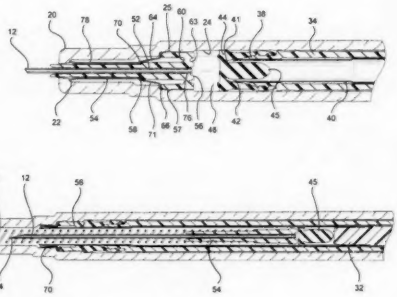
HYPODERMIC SYRINGE WITH SELECTIVELY RETRACTABLE NEEDLE

Simon Cohn, N. Arlington, N.J.; Roger Hoeck, Holdrege, Nebr.; Richard Caizza, Pompton Lakes, and Volker Niermann, Little Falls, both of N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 29, 2000, Appl. No. 677,050

Int. Cl. A61M *5/00*

U.S. Cl. 604—110 **19 Claims**



1. A hypodermic syringe with a selectively retractable needle comprises:

an elongate barrel having an open proximal end and a distal end defining a receiver having a distal inward shoulder, said barrel having a hollow bore therethrough extending from said proximal end to said distal end;

an elongate plunger having a proximal end and a distal end, said plunger including an inner rod extending a distance distally from said proximal end, a hollow sleeve having a proximal end and a distal end, sized to fit slidably, extend beyond and disposed over said inner rod, a hollow cutter extending distally from said inner rod to a distal cutting surface within said hollow sleeve, and a stopper disposed over said distal end of said hollow sleeve to cover said cutting surface, said stopper being sized to fit slidably within said hollow bore of said barrel to define a chamber to draw and expel fluid, said plunger further including a displaceable collar that substantially prevents a movement of said inner rod with respect to said hollow sleeve, said collar being displaced by application of a distal force, greater than a force required to expel fluid from said chamber in said barrel, to said plunger, said collar being displaced by engagement with said proximal end of said barrel, and, when said collar is displaced, allows a movement with respect to said hollow sleeve of said inner rod having said cutter attached thereto, and causes said cutting surface to cut through said stopper;

an elongate hub having a stem with a proximal flange and an engagement, said stem disposed within and sized for slidable movement within said receiver at said distal end of said barrel

with said flange having a distal surface and a proximal surface, said proximal surface of said flange defining a distal end of said chamber in said barrel, said hub having a passageway therethrough;

a clip having a proximal foot with an opening therethrough and a distal grip, said clip being disposed on said stem of said hub with said proximal foot at said distal surface of said flange and said grip at said engagement on said stem;

an elongate needle having a fluid path therethrough, said needle having a pointed distal end and a proximal end mounted in said passageway of said hub so that said pointed end of said needle extends distally outwardly and said fluid path of said needle is in fluid communication with said chamber of said barrel;

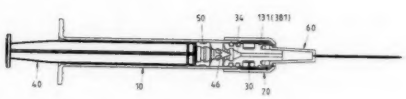
an elongate spring disposed about said stem of said hub compressed between said receiver and said distal grip of said clip to provide a bias, so that when sufficient distal force, greater than the force needed to expel fluid from said chamber, is applied to said plunger to cause said cutting surface to cut through said stopper, said cutting surface then engages said flange and cuts through said flange thereby to engage said clip and to cause said clip to release said engagement on said stem and to allow said bias of said spring to urge a sufficient movement of said hub to a position within said syringe where inadvertent contact with said pointed distal end of the needle is substantially prevented.

US 6,409,702 B1

PLUNGER AND NEEDLE HOLDER OF SAFETY HYPODERMIC SYRINGE

Chien-Kung Hu, Miao Li Hsien, Taiwan, assignor to Li-Hua Lu; Hung-Yang Fan, and Chu-Chun Chiu, all of Miao Li Hsien, Taiwan

Filed May 31, 2001, Appl. No. 867,529
Int. Cl. A61M *5/00*
U.S. Cl. 604—110 **10 Claims**



1. A safety hypodermic syringe comprising:

a barrel having a receiving hole;

a needle holder slidably and controllably disposed in said receiving hole of said barrel, said needle holder having an insertion hole, an inner tapered hole with a conical surface, a pull stop edge fixed between said insertion hole and said inner tapered hole, and a liquid transporting hole in communication with a hypodermic needle exiting from the inner tapered hole;

a plunger slidably engaged in the receiving hole of the barrel behind the needle holder, the plunger having a rod body;

an end of the rod body having a connection head with a conical front portion corresponding in shape to that of the inner tampered hole of the needle holder and a rear portion having two elastically deformable claws;

wherein during injection the plunger slides in the barrel so that the connection head passes through the insertion hole of the needle holder compressing the two elastically deformable claws until the conical front portion of the connection head is fully engaged against the conical surface of the inner tapered hole of the needle holder,

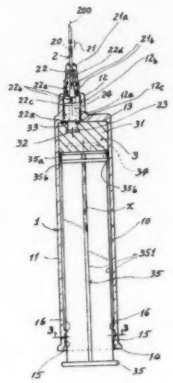
wherein the two elastically deformable claws then are released to engage the pull stop edge of the needle holder so as to permit withdrawal of the plunger from the barrel with the needle holder and movement of the hypodermic needle into the receiving hole of the barrel.

US 6,409,703 B1

SAFETY SYRINGE FOR INTRAVENOUS INJECTION

Wen-Chin Lu, Taipei, Taiwan, assignor to Otter Technology Limited, Tortola, Virgin Islands (Br.)

Filed Sep. 21, 2001, Appl. No. 961,570
Int. Cl. A61M *5/00*
U.S. Cl. 604—110 **6 Claims**



1. A safety syringe for intravenous injection comprising:

a syringe means including a syringe cylinder having a sleeve portion eccentrically formed on a front portion of said syringe cylinder;

a needle device detachably secured on said sleeve portion of said syringe cylinder and including: a hollow needle, a shank portion for externally connecting the hollow needle thereon and a locking head portion formed on a rear portion of said shank portion; and

a plunger means slidably held in said syringe cylinder, having a plunger secured to a plunger rod and a biasing socket eccentrically recessed in said plunger for coupling said locking head portion of said needle device in said biasing socket when completing an injection, said plunger as coupled with said needle device operatively retracted into said syringe cylinder for tilting said needle without re-protruding said needle forwardly from said sleeve portion;

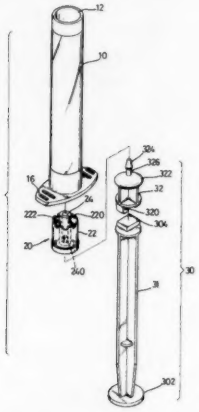
the improvement which comprises:

said sleeve portion having a plurality of sleeve ribs longitudinally formed on an inside wall in a sleeve hole formed through said sleeve portion;

said shank portion having a plurality of shank ribs longitudinally formed on an outer surface of said shank portion for respectively engaging said sleeve ribs in said sleeve portion, whereby upon securing of said shank portion in said sleeve portion and upon rotation of said shank portion, said shank ribs on said shank portion will be engaged and locked by said sleeve ribs in said sleeve portion for preventing a further rotation of said shank portion, thereby allowing a smooth connection of said hollow needle on said shank portion on said syringe cylinder; and

said syringe cylinder having at least a guiding means circumferentially formed on an inside wall of said syringe cylinder for slidably longitudinally guiding said plunger rod in said syringe cylinder to correspondingly align said biasing socket in said plunger with said locking head portion of said needle device for reliably coupling said plunger with said needle device upon completion of an injection.

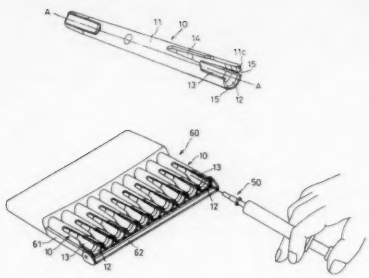
US 6,409,704 B1
RETRACTABLE SAFETY SYRINGE
Hsi-Chin Tsai, Shulin, Taiwan
Filed Nov. 19, 2001, Appl. No. 988,916
Int. Cl. A61M *5/00;5/32*
U.S. Cl. 604—110 **7 Claims**



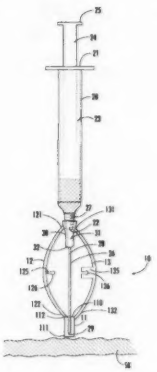
1. A retractable safety syringe comprising:
a syringe barrel (**10**) having a fixing hole (**12**) defined in an upper end thereof and a thumb press (**16**) formed at a lower end thereof;
a needle mount (**20**) assembled in the fixing hole (**12**) and retained at the upper end of the syringe barrel (**10**), and integrally formed with an outer hub (**22**) and an inner hub (**24**), wherein the inner hub (**24**) has a fluid passage defined in a center thereof and a plurality of equal-spaced spring clamps (**240**) formed around a lower end of the fluid passage and extending in an inclined direction towards an upper end of the fluid passage;
a plunger rod (**30**) consisting of a rod (**31**) and a plunger (**32**) detachably connected at an upper end of the rod (**31**), wherein the plunger (**32**) has a plunger crown (**322**), a cone-shaped tip end portion (**324**) formed on a top of the plunger crown (**322**), and a neck portion (**326**) formed between the tip end portion (**324**) and the plunger crown (**322**);
a needle (**40**) including a connecting portion (**41**) and a needle cannula (**42**);
whereby when the plunger rod (**30**) is completely extended into the syringe barrel (**10**), the tip end portion (**324**) is inserted into the fluid passage of the needle mount (**20**), the neck portion (**326**) is clamped by the plurality of spring clamps (**240**), therefore, the medicine fluid is able to flow over gaps between each two adjacent spring clamps (**240**) toward the needle (**40**), and then the needle (**40**) and the needle mount (**20**) are connected with the plunger rod (**30**) and retractable with the plunger rod (**30**).

US 6,409,705 B1
NEEDLE PROTECTING CAP AND NEEDLE DISPOSAL INSTRUMENT
Chikashi Kondo, Fukuoka, Japan, assignor to Noboro Hakozaki; Hideaki Yamada, both of Fukuoka-Ken; Kazuhisa Matsumoto, Ehime-ken, and Chisho Hagio, Fukuoka-Ken, all of Japan
PCT No. PCT/JP98/03466, § 371 Date Jan. 27, 2000, § 102(e) Date Jan. 27, 2000, PCT Pub. No. WO99/07423, PCT Pub. Date Feb. 18, 1999
PCT Filed Aug. 3, 1998, Appl. No. 463,752
Int. Cl. A61M *5/32*
U.S. Cl. 604—192 **14 Claims**

1. A needle disposal instrument comprising a case body which accommodates a plurality of needle protecting caps, each of the needle protecting caps being formed of a cylindrical body having an insertion port at one end thereof and capable of holding an injection needle, and holds the needle protecting caps in such a posture that used needles can be inserted from the insertion ports, and means for preventing the needle protecting caps attached to the case body from falling out.



US 6,409,706 B1
SAFETY SYRINGE, FLUID COLLECTION DEVICE, AND ASSOCIATED METHODS
Randall A. Loy, 3093 Timpana Point, Longwood, Fla. 32779
Filed May 14, 1999, Appl. No. 312,440
Int. Cl. A61M *5/32;5/00*
U.S. Cl. 604—198 **7 Claims**



1. A safety syringe comprising:
a barrel having a proximal and a distal opening and an interior space;
a plunger adapted to slide within the barrel interior space from a proximal end;
a needle affixed to the barrel at a distal end having a bore in communication with the barrel distal opening and a distal tip; and
a safety mechanism comprising:
a sheath having a longitudinal bore extending from a distal end to a proximal end, the bore adapted to slidingly admit a portion of the needle;
a pair of arms, each having a proximal end affixed adjacent the barrel distal end and a distal end affixed adjacent the sheath proximal end, the arms movable between a shielding position wherein the sheath is in covering relation to the needle tip and an injecting position wherein the needle tip extends beyond the sheath distal end, wherein the arms each comprise a metal strip and a flexible housing affixed in covering relation to an outside face of the metal strip, each metal strip is positioned in generally opposed relation about

the needle and outwardly bowed in the injecting position and biased toward a more straightened orientation for moving toward the shielding position; and

means for locking the arms in the shielding position.

US 6,409,707 B1

ANTI-SIPHON VALVE FOR MEDICAL INFUSION LINES AND THE LIKE

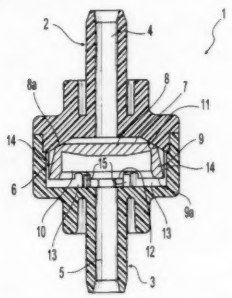
Gianni Guala, Turin, Italy, assignor to Industrie Borla Spa, Moncalieri, Italy

Filed Aug. 8, 2000, Appl. No. 635,007

Claims priority, application Italy, Oct. 22, 1999, TO99A0917

Int. Cl. F16K *15/14*

U.S. Cl. 604—247 **11 Claims**



1. An anti-siphon valve for medical infusion lines and the like, comprising one first tubular connector and one second tubular connector which define, respectively, a passage upstream and a passage downstream which are coaxial to one another, and a diaphragm arranged transversely between said first and second tubular connectors, said diaphragm being made of elastically deformable material and co-operating in a fluid-tight manner with an annular valve seat of said first tubular element to keep said anti-siphon valve normally closed, in which a pre-determined pressure of the fluid in said passage upstream causes a deflection of said diaphragm and opening of said anti-siphon valve, wherein said annular valve seat is defined by a conical-surface wall of said first tubular element, which diverges towards said second tubular element, and wherein said diaphragm consists of the bottom wall of a cup-shaped element having a side wall, said bottom wall having an external peripheral edge which is normally kept pressed in fluid-tight contact against said annular valve seat under the axial thrust exerted by said side wall of said cup element; the deflection of said bottom wall of said cup element produced in use by said pre-determined fluid pressure causing radial contraction of said external peripheral edge and consequent separation thereof from said annular valve seat.

US 6,409,708 B1

APPARATUS FOR ADMINISTRATING TOXIC FLUID

Göran Wessman, Göteborg, Sweden, assignor to Carmel Pharma AB, Gothenburg, Sweden

Continuation of application No. PCT/SE96/01411, filed on Nov. 4, 1996. This application May 4, 1999, Appl. No. 304,695.

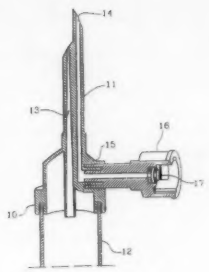
Int. Cl. A61M *25/00*

U.S. Cl. 604—284 **2 Claims**

1. An infusion device lateral to the ventilation duct for administering toxic fluid comprising:

an insertion portion for connecting via a proximal end thereof to an infusion bag when in an installed condition, said insertion portion having

a flow duct connectable to said infusion bag when in an installed condition via a free, proximal outlet end of the flow duct, and



a separate ventilation duct connectable to said infusion bag when in an installed condition via a free, proximal inlet end of the ventilation duct, the insertion portion being structured to provide that both the free end of the flow duct and the free end of the ventilation duct, when in an installed condition, are in fluid contact with an interior of the infusion bag simultaneously and independently of each other, the ventilation duct and the flow duct being permanently fixed in relation to each other;

the flow duct having an outlet at an opposite, distal end thereof; and,

the ventilating duct being constructed to provide, when in the installed condition, fluid communication between the infusion bag and an exterior of said infusion device,

an opposite, distal end of the ventilation duct opening to a connection arranged on a side of said infusion device for supplying said toxic fluid, wherein said connection is provided with at least one airtight, self-sealing membrane that is penetrable by an injection needle, which membrane automatically reseals upon withdrawal of the injection needle therefrom.

US 6,409,709 B1

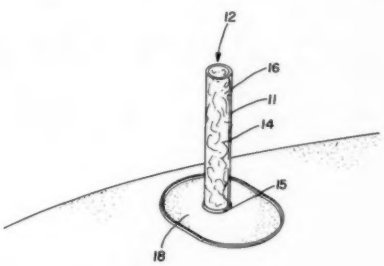
OSTOMY-CHANGING FACILITATING DEVICE

Sylvia Recto, 46500 Maidstone, Canton, Mich. 48187

Filed May 19, 2000, Appl. No. 573,972

Int. Cl. A61F *5/44*

U.S. Cl. 604—339 **6 Claims**



1. An ostomy-changing facilitating device comprising:

a tubular member having an open top end, an open bottom end and a bore extending therethrough with said bottom end being adapted to be disposed over a stoma; and

an absorbent material disposed in said bore of said tubular member for absorbing fluids from the stoma;

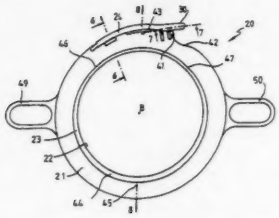
wherein said tubular member comprises a substantially cylindrical member having a rounded annular lip extending along an edge of said cylindrical member at said bottom end for facilitating contact with a user's skin and sealing about the stoma.

US 6,409,710 B1

COUPLING FOR OSTOMY APPLIANCE, AND OSTOMY APPLIANCE COMPRISING SUCH A COUPLING

Henri Holtermann, Saint-Jean-de-Luz, France, assignor to B. Braun Biotrol, Boulogne Billancourt, France

Filed Mar. 10, 1999, Appl. No. 265,755
Claims priority, application France, Mar. 12, 1998, 98 03061
Int. Cl. A61F *5/44*
U.S. Cl. 604—342 **21 Claims**



1. A coupling for an ostomy appliance, comprising:

first and second coupling members, each including a base defining a plane and equipped with a central opening, and a tubular joining piece surrounding said opening,

the joining piece of the first member comprising, on an internal face, an elastically deformable annular lip whose free end is directed towards the plane of the base of said first member, and

the joining piece of the second member including, on an external face, means for retaining axially the free end of said elastically deformable annular lip, and wherein said means occupies a part of the circumference of the tubular joining piece of the second coupling member, and guarantees, on that part of circumference, an axial retention of the free end of the annular lip of the first coupling member; and wherein

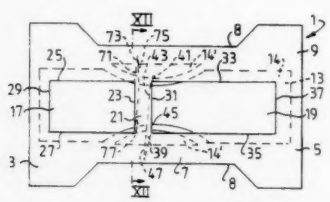
said coupling further includes a locking member which is either in one piece with the first coupling member or in one piece with the second coupling member, but which in either case is located diametrically opposite the midpoint of the means for axial retention of the free end of the annular lip.

US 6,409,711 B1

BARRIER FOR AN ABSORBENT PRODUCT

Anna-Karin Jönbrink, Lerum, Sweden, assignor to SCA Hygiene Products AB, Gothenberg, Sweden

PCT No. PCT/SE98/00859, § 371 Date Feb. 22, 2000, § 102(e) Date Feb. 22, 2000, PCT Pub. No. WO98/53779, PCT Pub. Date Dec. 3, 1998
PCT Filed May 11, 1998, Appl. No. 423,976
Claims priority, application Sweden, May 26, 1997, 9701983
Int. Cl. A61F *13/15*
U.S. Cl. 604—385.01 **18 Claims**



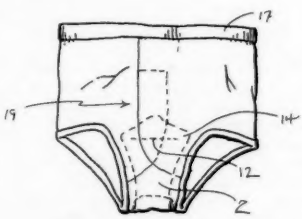
1. Absorbent product (**1**) such as a diaper, a pant diaper, an incontinence shield or the like comprising a front portion (**3**), a rear portion (**5**) and an intermediate crotch portion (**7**) wherein said absorbent product (**1**) includes a top sheet (**9**), made of a top sheet material, which is intended to face towards the user when the product is worn, a bottom sheet (**11**) which is intended to face away from the user when the product is worm, and an absorbent body (**13**) between said top sheet (**9**) and said bottom sheet (**11**), wherein said top sheet (**9**) is provided with at least two openings comprising urine opening (**17**), faeces openings (**19**) and optionally leg openings (**8**), separated by a bridge (**21**) of top sheet material, each said opening (**8**, **17**, **19**) having a bridge end (**23**, **1**, **93**), a distal end (**29**, **37**, **95**) and two sides (**25**, **27**, **33**, **35**, **89**, **91**) characterised in that a flap (**39**; **53**, **71**, **79'**, **79"**, **81**) of top sheet material, having a bridge end (**41**; **55**, **80'**, **80"**), longitudinal sides (**43**, **45**; **57**, **58**, **59**, **82'**, **82"**, **84'**, **84"**) and a distal end (**47**; **61**, **86'**, **86"**), and which is cut out to form at least one of said openings (**8**, **17**, **19**), is attached by one of said ends (**41**, **47**, **55**, **61**, **80'**, **80"**, **86'**, **86"**) or said sides (**43**, **45**; **57**, **58**, **59**, **82'**, **82"**, **84'**, **84"**) to said bridge (**21**) and wherein said flap (**39**; **53**, **71**, **79'**, **79"**, **81**) is fastened to said absorbent body (**13**) and/or said top sheet (**9**) and/or said bottom sheet (**11**) by another of said ends (**41**, **47**, **55**, **61 80'**, **80"**, **86'**, **86"**) and/or said longitudinal sides (**43**, **45**; **57**, **58**, **59**, **82'**, **82"**, **84'**, **84"**).

US 6,409,712 B1

MASCULINE HYGIENIC DEVICE FOR DAILY USE

Rodrigo Alberto Terán Dutari, P.O. Box 6-4024, El Dorado, Panama

Filed Dec. 3, 1999, Appl. No. 454,025
Int. Cl. A61F *13/15*
U.S. Cl. 604—385.09 **16 Claims**



1. A replaceable male hygienic device being placed in a user's crotch region between the legs and interposed between the user's body and an undergarment, the hygienic device comprising:

a single panel defining an elongate ergonomically contoured moisture absorbent pad comprising at least a first layer of flexible, moisture absorbent material defining a forward portion wider than a rear portion; and

a single slit provided in the wider front portion of the pad and cut completely through the single panel to create a passage through the forward portion of the device.

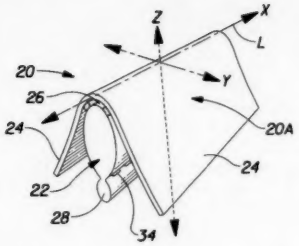
US 6,409,713 B1

EMOLLIENT-TREATED ABSORBENT INTERLABIAL APPLICATION

Thomas Ward Osborn, III, and Thomas James Klofta, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of application No. 08/706,371, filed on Aug. 28, 1996, now Pat. No. 5,885,265, and a continuation-in-part of application No. 08/778,521, filed on Jan. 3, 1997, now Pat. No. 6,254,584, and a continuation-in-part of application No. 08/778,925, filed on Jan. 3, 1997, now abandoned, and a continuation-in-part of application No. 08/778,520, filed on Jan. 3, 1997, now Pat. No. 5,895,381. This application Jun. 5, 1997, Appl. No. 869,897.
This patent is subject to a terminal disclaimer.
Int. Cl. A61F *13/15*
U.S. Cl. 604—385.17 **3 Claims**

1. An absorbent device for wearing in the interlabial space of a female wearer, said absorbent device having a body-contacting



surface at least a portion of which is capable of maintaining contact with the inside surfaces of the wearer's labia when the absorbent device is worn, and an absorbent portion, wherein at least a portion of said body-contacting surface comprises an emollient composition, said emollient composition comprising a substantially water-free emollient, said emollient composition being free of hydrocarbon components having a molecular weight greater than or equal to 1,500, wherein at least a portion of said emollient composition remains on said body-contacting surface without being absorbed into said absorbent device, and wherein said absorbent device is sufficiently flushable that it completely clears the bowl under the Flushability Test at least about 70% of the time in two or fewer flushes.

US 6,409,714 B2

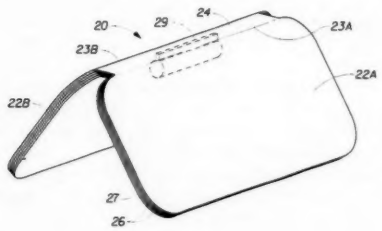
THIN COMFORTABLE INTERLABIAL ABSORBENT STRUCTURE

Thomas Ward Osborn, III, Cincinnati, Ohio; Katherine Louise Mayer, Newport, Ky.; Letha Margory Hines, Cincinnati, and Edward J. Milbrada, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of application No. 08/778,521, filed on Jan. 3, 1997, now Pat. No. 6,254,584. This application Dec. 18, 2000, Appl. No. 740,243.

Int. Cl. A61F *13/15*

U.S. Cl. 604—385.17 **5 Claims**



1. An absorbent interlabial device comprising:

a pair of absorbent panels having a body contacting surface and an opposed rear surface, wherein each of said panels has a proximal edge and a distal edge, wherein said proximal edges coincide at a preferential fold line;

a liquid impervious backsheet disposed over at least a portion of said rear surface; and

a grasping tab attached to said backsheet and depending therefrom.

US 6,409,715 B1

DISPOSABLE ABSORBENT ARTICLE

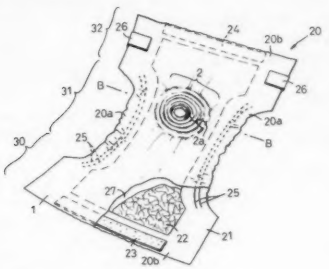
Hiroyuki Tanji, Kagawa-ken, Japan, assignor to Uni-Charm Corporation, Ehime-ken, Japan

Filed Jun. 8, 2000, Appl. No. 589,079

Claims priority, application Japan, Jun. 9, 1999, 11-163025

Int. Cl. A61F *13/15*

U.S. Cl. 604—385.19 **10 Claims**



1. A disposable absorbent article comprising:

a liquid-permeable topsheet;

a liquid-impermeable backsheet;

a liquid-absorbent core disposed therebetween; and said topsheet being provided at a predetermined location on upper and lower surfaces thereof with a stretchable region adapted to be stretchable up- and downward with respect to said upper and lower surfaces, said stretchable region being formed by a plurality of pleats which undulate from a peripheral edge toward a central zone of said stretchable region and which are in the form of regression lines that are coaxially arranged.

US 6,409,716 B1

DRUG DELIVERY

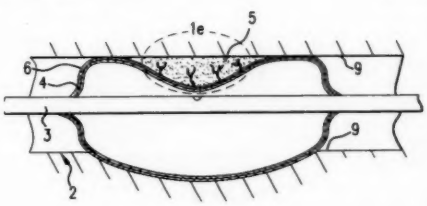
Ronald A. Sahatjian, Lexington, and James J. Barry, Marlborough, both of Mass., assignors to Scimed Life Systems, Inc., Maple Grove, Minn.

Continuation of application No. 08/097,248, filed on Jul. 23, 1993, now Pat. No. 5,674,192, which is a continuation-in-part of application No. 07/795,976, filed on Nov. 22, 1991, now Pat. No. 5,304,121, which is a continuation-in-part of application No. 07/635,732, filed on Dec. 28, 1990, now abandoned, which is a continuation-in-part of application No. 07/451,507, filed on Dec. 15, 1989, now Pat. No. 5,135,816. This application Oct. 7, 1997, Appl. No. 946,207.

This patent is subject to a terminal disclaimer.

Int. Cl. A61M *31/00*

U.S. Cl. 604—509 **11 Claims**



1. A method for delivering a nucleic acid drug to tissue at a desired location of a vascular lumen, comprising:

providing an expandable stent wherein at least a portion of the exterior surface of the stent comprises a coating of a swellable hydrogel polymer having said nucleic acid drug incorporated therein;

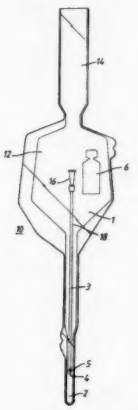
positioning said stent with said hydrogel coating at said location; and

expanding said stent so that said hydrogel polymer contacts the tissue.

US 6,409,717 B1
HYDROPHILIC URINARY CATHETER HAVING A WATER-CONTAINING SACHET

Anette Israelsson; Agnetta Pettersson, both of Göteborg, and Jan Utas, Kungsbacka, all of Sweden, assignors to Astra Aktiebolag, Sodertalje, Sweden

PCT No. PCT/SE97/00096, § 371 Date Mar. 21, 1997, § 102(e) Date Mar. 21, 1997, PCT Pub. No. WO97/26937, PCT Pub. Date Jul. 31, 1997
PCT Filed Jan. 22, 1997, Appl. No. 809,481
Claims priority, application Sweden, Jan. 25, 1996, 9600276
Int. Cl. A61M *27/00*
U.S. Cl. 604—544 **26 Claims**



1. A wetting apparatus for wetting a hydrophilic urinary catheter prior to use comprising:

a wetting receptacle which defines a wetting fluid receiving area,

a urinary catheter having a hydrophilic outer surface on at least an insertable length of the catheter arranged in said receptacle, and

a wetting fluid container having a discharge outlet movable from a closed position to an open position on application of a predetermined condition thereto to enable the wetting fluid to be discharged from the wetting fluid container, wherein:

the wetting fluid container is integrated with the wetting receptacle;

at least the discharge outlet of the wetting fluid container is disposed within the bounds of the wetting receptacle;

the discharge outlet of the wetting fluid container is in fluid communication with the wetting fluid receiving area; and

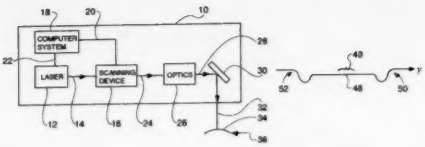
an application of the predetermined condition to the discharge outlet of the wetting fluid container enables the wetting fluid to be discharged into the wetting fluid receiving area and, thereby, to wet the at least insertable length of the hydrophilic urinary catheter.

US 6,409,718 B1
DEVICE AND METHOD FOR CORRECTING ASTIGMATISM BY LASER ABLATION

Fuqian Tang, Orlando, Fla., assignor to LaserSight Technologies, Inc., Winter Park, Fla.

Filed Feb. 3, 1998, Appl. No. 17,680
Int. Cl. A61B *18/18*
U.S. Cl. 606—5 **4 Claims**

1. A method for correcting astigmatism in an eye, said method comprising:



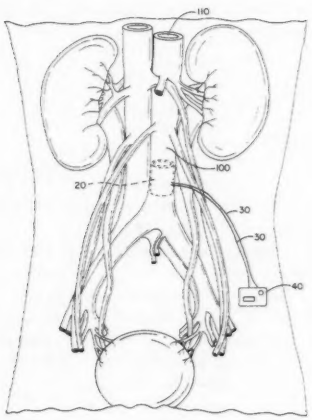
scanning an ablating laser beam in a predetermined pattern across an ablation zone of said eye to form a cylindrical-shaped ablation in a cornea of said eye; and

over ablating a transition region in each end of said cylindrical-shaped ablation.

US 6,409,719 B1
LIGHT STINT IMPLANT DEVICE FOR TREATMENT OF LONG TERM VIRAL INFECTION

Don A. Manning, 4370 S. Alabama, Monroeville, Ala. 36460

Filed Sep. 18, 2000, Appl. No. 663,786
Int. Cl. A61B *18/18*
U.S. Cl. 606—14 **4 Claims**



1. A light stint implant device adapted to be surgically implanted in a major artery for assisting in the treatment of long term viral infection, alone or in combination with anti-viral drugs, the invention comprising:

a. a thin, hollow, cylindrical illuminating light stint adapted to be implanted within the major artery having an illuminating means, an inner surface and an outer surface, the outer surface being provided with electrodes;

b. a pair of electronic leads having a first end and a second end, the first end of the electronic leads connected to the electrodes on the outer surface of the illuminating light stint; and

c. a control unit containing a removable access panel, an inner low voltage, long-term power supply connected to the second end of the electronic leads and a programmable timing means connected to the inner low voltage, long-term power supply to periodically activate the inner low voltage, long-term power supply causing such inner low voltage, long-term power supply to activate the illuminating means in the illuminating light stint providing light to the inner surface of the illuminating light stint and blood flowing along the inner surface of the illuminating light stint.

US 6,409,720 B1

METHODS OF TONGUE REDUCTION USING HIGH INTENSITY FOCUSED ULTRASOUND TO FORM AN ABLATED TISSUE AREA CONTAINING A PLURALITY OF LESIONS

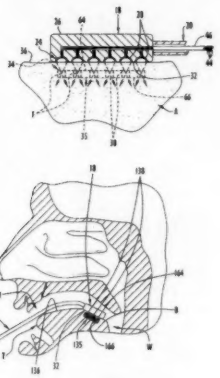
James B. Hissong, and Fred B. Dinger, III, both of Jacksonville, Fla., assignors to Medtronic Xomed, Inc., Jacksonville, Fla.

Continuation-in-part of application No. 09/487,707, filed on Jan. 19, 2000. This application Jul. 31, 2000, Appl. No. 629,197.

This patent is subject to a terminal disclaimer.

Int. Cl. A61B *18/18*

U.S. Cl. 606—27 **20 Claims**



1. A method of thermal ablation of the tongue comprising the steps of

introducing an ultrasound emitting member in a patient's oral cavity;

positioning the ultrasound emitting member adjacent an external tissue surface of the tongue;

emitting ultrasound energy from the ultrasound emitting member into the tissue of the tongue;

focusing the ultrasound energy at a plurality of focusing zones contained in a target area in the tongue;

heating the tissue of the tongue at the focusing zones with the focused ultrasound energy to form an ablated tissue area at the target area containing unablated tissue of the tongue and a plurality of lesions at the focusing zones, respectively, at which the tissue of the tongue is ablated; and

withdrawing the ultrasound emitting member from the oral cavity.

US 6,409,721 B1

PROCESS FOR FORMING AN OCCLUSION IN A BODY CAVITY

E. Thomas Wheelock, Los Altos; Erik T. Engelson, Encinal, and Harold F. Carrison, Pleasanton, all of Calif., assignors to Target Therapeutics, Inc., Fremont, Calif.

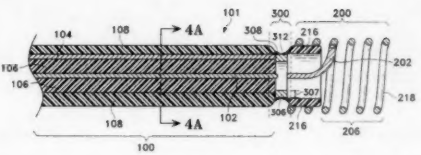
Continuation of application No. 09/026,373, filed on Feb. 19, 1998, now Pat. No. 6,077,260. This application Mar. 10, 2000, Appl. No. 523,540.

Int. Cl. A61B *18/14;17/00*

U.S. Cl. 606—32 **20 Claims**

1. A process for forming an occlusion in a body cavity in the presence of ionic body fluids, comprising:

deploying a conductive implant detachably connected to a pusher wire at least partially into a body cavity, said pusher wire being insulated from said implant, said implant forming a return path for current provided to said pusher wire through ionic body fluids, and



imposing a current in said pusher wire such that an electrolytically severable joint disposed between said implant and said pusher wire releases said implant from said pusher wire.

US 6,409,722 B1

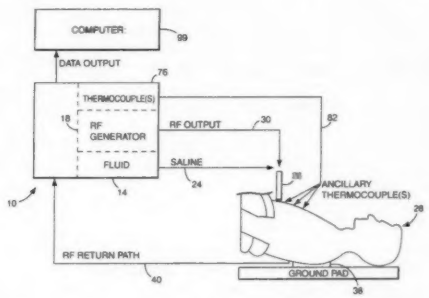
APPARATUS AND METHOD FOR CREATING, MAINTAINING, AND CONTROLLING A VIRTUAL ELECTRODE USED FOR THE ABLATION OF TISSUE

Michael F. Hoey; Mark A. Christopherson, both of Shoreview, and Steven M. Goetz, Fridley, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Provisional application No. 60/091,959, filed on Jul. 7, 1998. This application Jul. 6, 1999, Appl. No. 347,635.

Int. Cl. A61B *18/18*

U.S. Cl. 606—34 **23 Claims**



1. An apparatus for producing, maintaining, and controlling a virtual electrode for a provision of RF current therapy through the virtual electrode to a target tissue of a body of a patient, the apparatus providing a conductive fluid and an RF current via at least one surgical instrument to the target tissue to create the virtual electrode, the apparatus comprises:

a generator of RF current, the generator supplying the RF current to the virtual electrode via the surgical instrument;

means for detecting an electrical arc;

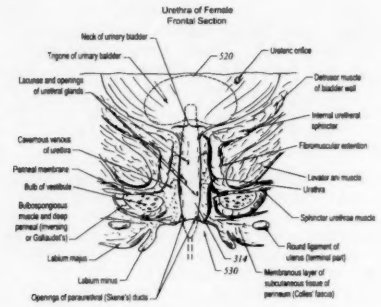
means for measuring the impedance of the body of the patient to the passage of the RF current;

at least one primary temperature sensor for sensing the temperature at least a first predetermined location in the body of the patient;

at least one source of conductive fluid selectively providing conductive fluid to the target tissue; and

means for controlling a rate of application of the conductive fluid to the target tissue and for controlling a power level of the RF current, the means for controlling receiving arc detection signals from the arc detection means, impedance measurement signals from the impedance measuring means, and temperature measurement signals from the at least one temperature sensor, the power level of the RF current and the rate of conductive fluid flow controlled by the controlling means in response to changes in the measured impedance and the sensed temperature, the means for controlling discontinuing the application of RF current for a predetermined period of time upon receiving signals indicating a detection of an electrical arc.

US 6,409,723 B1
TREATING BODY TISSUE BY APPLYING ENERGY AND SUBSTANCES
Stuart D. Edwards, 658 Westridge Dr., Portola Valley, Calif. 94028, assignor to Stuart D. Edwards, Portola Valley, Calif.
Filed Apr. 2, 1999, Appl. No. 285,575
Int. Cl. A61B *18/18*
U.S. Cl. 606—41 **18 Claims**



1. An apparatus for treatment of the ingestive end of the gastrointestinal system including

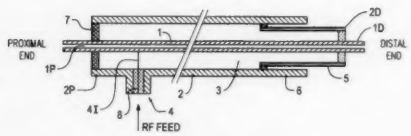
a catheter composed of biologically nonreactive material having a distal and proximal end and a plurality of lumens running the length of the catheter, wherein said catheter is disposed for insertion into the oral cavity or a stoma;

a distal balloon mounted circumferentially on said distal end of said catheter;

a proximal balloon mounted circumferentially on said proximal end of said catheter; and

a treatment element mounted upon said catheter between said distal balloon and said proximal balloon.

US 6,409,724 B1
ELECTROSURGICAL INSTRUMENT
Keith Penny, Monmouth; Francis E Amoah, Cardiff, and Colin Charles Owen Goble, South Glamorgan, all of United Kingdom, assignors to Gyrus Medical Limited, Cardiff, United Kingdom
Provisional application No. 60/141,262, filed on Jun. 30, 1999. This application May 24, 2000, Appl. No. 576,630.
Claims priority, application United Kingdom, May 28, 1999, 9912627
Int. Cl. A61B *18/18*
U.S. Cl. 606—41 **28 Claims**



1. An electrosurgical instrument comprising:

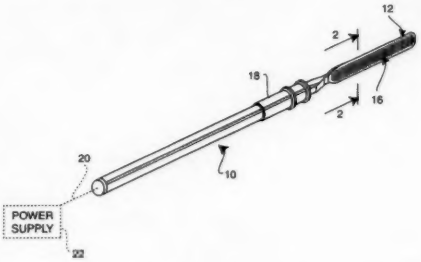
an elongate inner tubular member having a proximal end and a distal end, at least a portion of the inner member being electrically conductive in order that there is d.c. electrical continuity between said ends; and

an elongate tubular electrically conductive sheath surrounding the inner member but spaced from the conductive material of the inner member to form an electrically insulative layer, whereby the inner member and the sheath constitute a coaxial transmission line, the sheath being electrically coupled to the inner member at a location spaced proximally from the distal end;

a feeder coupled to the inner member distally of the connection between the sheath and the inner member; and

an r.f. isolating structure between said couplings of the inner member to the feeder and to the sheath, the isolating structure presenting a series impedance between said couplings at an operating frequency of the instrument.

US 6,409,725 B1
ELECTROSURGICAL KNIFE
Ashok C Khandkar, and Aaron A. Hofmann, both of Salt Lake City, Utah, assignors to Triad Surgical Technologies, Inc., Salt Lake City, Utah
Filed Feb. 1, 2000, Appl. No. 495,570
Int. Cl. A61B *18/18*
U.S. Cl. 606—45 **46 Claims**



1. An electrosurgical instrument for cooperation with a supply of electrical energy, said electrosurgical instrument of the type including a handle, one or more conductors coupling the power supply to the handle, and a knife blade for use in the hemostatic cutting of soft tissue, said cutting being accomplished through the transfer of electrical energy from the knife blade to a patient during surgery primarily through conduction, said knife blade comprising:

a conductive substrate having a surface;

one or more coatings applied to at least a portion of the conductive substrate,

at least one of said one or more coatings including a non-stick polymer agent substantially uniformly impregnated with a conductive agent; and

at least a portion of said at least one of said one or more coatings being coated with a top coating including a non-stick agent impregnated substantially uniformly with a conductive agent and a hardening agent.

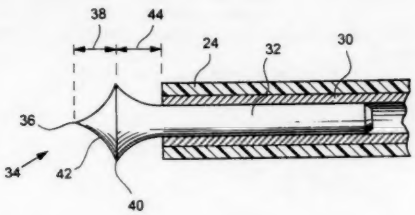
US 6,409,726 B1
ELECTROSURGICAL INSTRUMENT FOR EAR SURGERY
Alan G. Ellman, and Jon C. Garito, both of 1135 Railroad Ave., Hewlett, N.Y. 11557
Continuation-in-part of application No. 09/483,993, filed on Jan. 18, 2000, which is a continuation-in-part of application No. 09/435,677, filed on Nov. 8, 1999. This application Nov. 3, 2000, Appl. No. 705,201.
Int. Cl. A61B *18/18*
U.S. Cl. 606—45 **6 Claims**

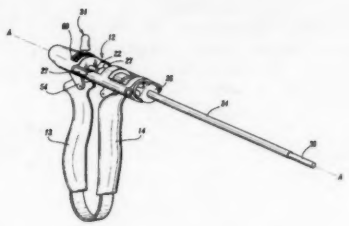
1. A unipolar electrosurgical electrode for forming a hole in the tympanic membrane of a patient, comprising:

a) an electrode holder,

b) an electrically-conductive member having a first end and a second end mounted in the holder,

c) said second end having an active, electrically-conductive, end portion comprising a tapered flared conical body terminating in a sharp point forming a flared conical tip, the widest part of the tapered conical body having a diameter of about 1.5–3 mm,





d) said active end portion being exposed electrically for applying unipolar electrosurgical currents to said tympanic membrane when the electrically-conductive member is connected to a source of electrosurgical currents,

e) portions of the electrode holder adjacent said exposed end portion being electrically-insulating to prevent contact and passage of electrosurgical currents to tissue areas adjacent to or surrounding the hole to be formed,

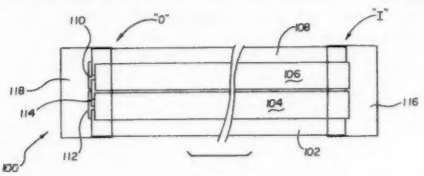
f) whereby a 1.5–3 mm hole is formed in the tympanic membrane when the electrosurgical source is activated and the exposed end of the electrode is placed against the tympanic membrane.

US 6,409,727 B1

MULTIFILAR FLEXIBLE ROTARY SHAFT AND MEDICAL INSTRUMENTS INCORPORATING THE SAME

Thomas O. Bales, Coral Gables, and Juergen A. Kortenbach, Miami Springs, both of Fla., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.

Filed Oct. 15, 1999, Appl. No. 418,769
Int. Cl. A61B *18/18*
U.S. Cl. 606—47 **18 Claims**



1. A flexible rotary shaft, comprising:

a) a flexible sheath having an input end and an output end; and

b) a shaft rotatably disposed within the sheath, the shaft comprised of a plurality of individual wire filaments, each having an input end and an output end and each extending through said flexible sheath, wherein

the input end of each individual wire filament is coupled to the input end of each other individual wire filament,

the output end of each individual wire filament is coupled to the output end of each other individual wire filament,

between their input ends and their output ends, said individual wire filaments are loosely associated.

US 6,409,728 B1

ROTATABLE BIPOLAR FORCEPS

Chris Ehr, Longmont, Colo.; Heinz Hluchy, Mössingen, Germany, and Valintina Arroyo, Erie, Colo., assignors to Sherwood Services AG, Schauffhausen, Switzerland

Provisional application No. 60/150,753, filed on Aug. 25, 1999. This application Aug. 1, 2000, Appl. No. 629,670.
Int. Cl. A61B *18/18*
U.S. Cl. 606—51 **19 Claims**

1. A rotatable bipolar forceps, comprising:

a body portion defining a longitudinal axis;

an electrode selectively removable from the body portion; the electrode connecting a pair of jaws to a source of electrical energy;

a shaft extending from the body portion;

at least one handle attached to the body portion for imparting movement to the shaft which causes the jaws to move from a first open position wherein the jaws are disposed in spaced relation relative to one another to a second clamping position wherein the jaws are moved closer together to grasp tissue therebetween; and

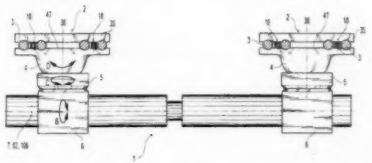
a rotating member cooperating with the electrode; the rotating member rotating the electrode and the jaws relative to the longitudinal axis of the body portion and releasably coupling the electrode to the body portion.

US 6,409,729 B1

CLAMP ASSEMBLY FOR AN EXTERNAL FIXATION SYSTEM

Orlando Martinelli, Bern; Beat Inauen, Hölstein; Erwin Flühler, Allschwil, all of Switzerland; Lutz Claes, Neu-Ulm, Germany; Heinz Gerngross, Ulm, Germany, and Götz Rübsaamen, Traunstein, Germany, assignors to Synthes (USA), Paoli, Pa.

Continuation of application No. PCT/CH98/00207, filed on May 19, 1998. This application Nov. 20, 2000, Appl. No. 714,990.
Int. Cl. A61B *17/64*
U.S. Cl. 606—59 **37 Claims**



19. An external bone fixation system for clamping bone pins and a connecting element, the system comprising a first element having top and bottom surfaces, a second element having top and bottom surfaces, the first and second elements being configured and dimensioned for retaining bone pins therebetween, a third element having top and bottom surfaces, and a fourth element having top and bottom surfaces,

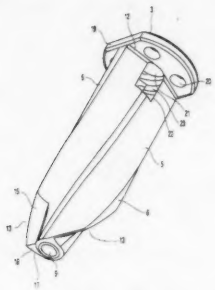
wherein the second, third, and fourth elements are coupled by a common fastener disposed along a common axis, and the first and second elements are coupled by at least one fastener remote from the common axis,

the second and third elements can swivel with respect to each other to be generally oriented transverse to the common axis, and the third and fourth elements can rotate with respect to each other about the common axis,

the bottom surface of the second elememt is clampable against the top surface of the third element, and bottom surface of the third element is clampable against the top surface of the fourth element, and

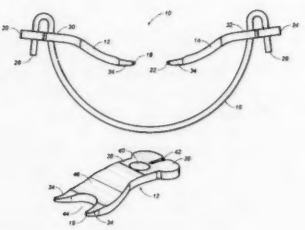
the fourth element includes a borehole extending therethrough for receiving the connecting element.

US 6,409,730 B1
HUMERAL SPIRAL BLADE
James M. Green, Portland, Oreg., and Stanley J. Kmiec, Jr., Coopersburg, Pa., assignors to Synthes (USA), Paoli, Pa.
Filed May 31, 2000, Appl. No. 584,381
Int. Cl. A61B *17/84*
U.S. Cl. 606—72 20 Claims



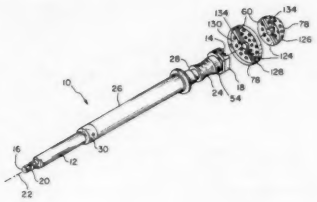
1. An implant for a bone said implant comprising:
a body member having a lateral portion and a medial portion and a helically twisted blade extending along the body and having a longitudinal axis;
said lateral portion having a circumferential collar extending in a plane perpendicular to said longitudinal axis; and
said circumferential collar having an attachment element for attaching a tissue fastener for repairing tissue surrounding the bone, said circumferential collar having a central hole configured with threads to releasably engage a tool for positioning the implant in the bone.

US 6,409,731 B1
BONE LEVELER APPARATUS
Marcos V. Masson, and Mark Henry, both of Houston, Tex., assignors to Global Orthopaedic Solutions, L.L.C., Houston, Tex.
Filed Jul. 30, 2001, Appl. No. 916,832
Int. Cl. A61F *5/00*
U.S. Cl. 606—86 18 Claims



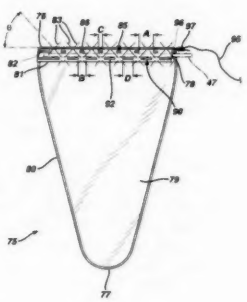
12. A bone leveler comprising:
a blade member having a forward end suitable for contacting the bone and a rearward end, said blade member having a hole formed therein between said forward end and said rearward end, said hole being suitable for receiving a portion of the surgical tubing therein, said blade member having a slot formed at said rearward end and extending inwardly from said rearward end, said slot being tapered so as to have a wide end opening at said rearward end and a narrow end adjacent said hole.

US 6,409,732 B1
TOOL DRIVER
Paul E. Salyer, Warsaw, Ind., assignor to Othy, Inc., Warsaw, Ind.
Filed Jul. 9, 1999, Appl. No. 349,381
Int. Cl. A61B *17/58*
U.S. Cl. 606—91 19 Claims



1. A tool driver comprising a shaft having a longitudinal axis and opposite ends, a boss at one of said shaft ends, a tool collet at the other of said shaft ends, said boss having a bayonet type latch mechanism therein, said latch mechanism having an axially extending inwardly tapered bore extending from said one end coaxially of said shaft into said boss, said tapered bore being adapted to receive a coaxially located disc of a tool to be connected to said tool driver within said tapered bore, said tapered bore and said tool disc coaxially centering said tool on said axis of said tool driver.

US 6,409,733 B1
SPECIMEN RETRIEVAL BAG
Sean P. Conlon, Loveland, and Karen M. Teotia, Cincinnati, both of Ohio, assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio
Filed Jun. 29, 2001, Appl. No. 897,821
Int. Cl. A61B *17/24*
U.S. Cl. 606—114 15 Claims



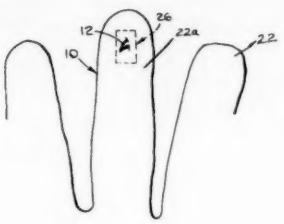
1. A surgical instrument for the removal of biological material from a patient, the surgical instrument comprising:
a) a specimen retrieval bag having a flexible wall and a closed end and an open end, said open end for receiving biological materials therein;
b) a noose adjacent to said open end, said noose constricts said open end to substantially close said open end,
c) a row of alternating flexible and stiff areas on said wall adjacent to and about a periphery of said open end, whereby when said open end is noosed, said flexible areas buckle before said stiff areas.

US 6,409,734 B1

AMNIOTOMY GLOVE

Helio Zapata, 4142 W. Cleveland, Skokie, Ill. 60076

Filed Jul. 9, 1999, Appl. No. 349,798
Int. Cl. A61B *17/42*
U.S. Cl. 606—125 **6 Claims**



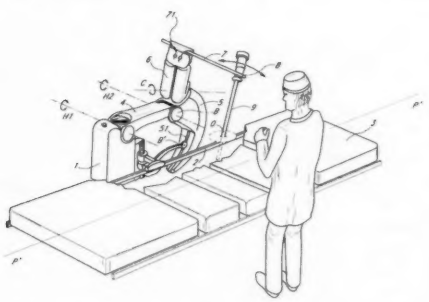
1. An amniotomy glove formed of flexible elastic latex material and capable of fitting on the hand of the users said glove having thumb and finger stalls including a middle finger stall having an interior wall and a tip and capable of receiving the middle finger of the user, a structural base element having a puncturing hook portion bonded thereto, said structural base element being bonded to the interior wall of said middle finger stall at a location adjacent but spaced slightly from the tip of said middle finger stall with said puncturing hook portion extending through the interior wall of said middle finger enabling said puncturing hook portion to pierce the amniotic membrane for effecting the rupture thereof.

US 6,409,735 B1

DEVICE FOR POSITIONING SURGICAL INSTRUMENTS

Jacques Andre, Waterloo; Jean Mangez, Namur; Xavier Moreels, Gembloux, and Roland Polet, Tervuren, all of Belgium, assignors to Medsys S.A., Gembloux, Belgium

PCT No. PCT/BE98/00177, § 371 Date Jul. 14, 2000, § 102(e) Date Jul. 14, 2000, PCT Pub. No. WO99/25267, PCT Pub. Date May 27, 1999
PCT Filed Nov. 16, 1998, Appl. No. 554,519
Claims priority, application European Pat. Off., Nov. 14, 1997, 97870183
Int. Cl. A61B *19/00*
U.S. Cl. 606—130 **11 Claims**



1. A device for handling a surgical instrument, comprising:

a fixed support;

a first moveable element having a first end and a second end, the first moveable element at the first end being articulated on the fixed support about a first axis essentially parallel to a plane in which a patient is arranged and capable of executing a first movement;

a second moveable element, having a first end and a second end, articulated on the second end of the first moveable element about a second axis essentially parallel to the plane in which the patient is arranged and capable of executing a second movement;

a deformable element having a first side and a second side, the deformable element fastened on the first side to the second end of the second moveable element and capable of executing a third rotational movement about a third axis;

a gripping element fastened to the second side of the deformable element;

a securing device configured to secure a surgical instrument to the gripping element, and

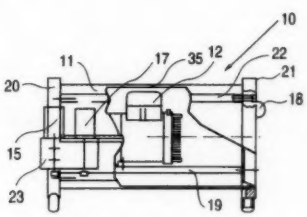
actuators configured to provide for rotational movements about said axes.

US 6,409,736 B1

DERMABRASION APPARATUS OPERATING BY A FLOW OF REDUCING SUBSTANCES, HAVING DISPOSABLE STERILIZED COMPONENTS

Gian Franco Bernabei, Florence, Italy, assignor to Mattioli Engineering Ltd., London, United Kingdom

Continuation of application No. 08/797,909, filed on Feb. 10, 1997, now Pat. No. 6,120,512. This application May 2, 2000, Appl. No. 562,005.
Claims priority, application Italy, May 10, 1996, FI96A0108
This patent is subject to a terminal disclaimer.
Int. Cl. A61B *17/50*
U.S. Cl. 606—131 **4 Claims**



1. Dermabrasion treatment kit, comprising:

a mixing bottle adapted to hold a dermabrasion substance therein, said mixing bottle having an input port and an output port;

a contacting handle configured to receive the dermabrasion substance from said mixing bottle and to provide the dermabrasion substance to a patient in contact with said contacting handle;

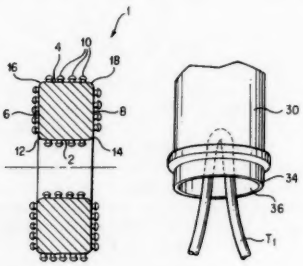
a collecting bottle configured to collect the dermabrasion substance from said contacting handle after the dermabrasion substance has made contact with the patient, said collecting bottle having an input port and an output port; and

a tray for holding said mixing bottle and said collecting bottle in place,

wherein input port and said output port of said mixing bottle and said input port and said output port of said collecting bottle are configured to be sealingly connected to said tray and to said contacting handle, via said tray, so as to provide the dermabrasion substance from said output port of said mixing bottle to said contacting handle via a first passageway within said tray, and so as to provide the dermabrasion substance from said contacting handle to said collecting bottle via a second passageway within said tray, so that said dermabrasion substance is sealingly protected from an exterior atmosphere as said dermabrasion substance travels from said mixing bottle to said contacting handle and then to said collecting bottle,

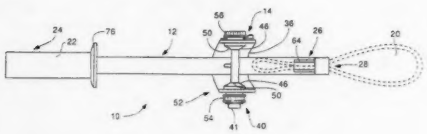
wherein said mixing bottle and said collecting bottle are constructed from one of a plastic and a vetrous material.

US 6,409,737 B1
LIGATING BAND WITH ROUNDED EDGES AND METHOD OF USE OF SAME
Richard C. Fortier, Concord, and Susan M. Ostrowski, Arlington, both of Mass., assignors to Scimed Life Systems, Inc., Maple Grove, Minn.
Continuation of application No. 09/056,575, filed on Apr. 7, 1998, now Pat. No. 5,972,009. This application Oct. 8, 1999, Appl. No. 645,987.
This patent is subject to a terminal disclaimer.
Int. Cl. A61B *17/12*
U.S. Cl. 606—140 **9 Claims**



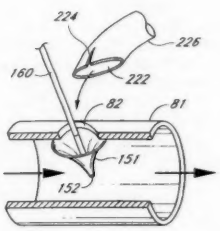
4. A method of ligating tissue within a living body comprising the steps of:
positioning an elastic band which has been stretched to increase the size of a central opening extending therethrough adjacent to a portion of tissue to be ligated, wherein the elastic band is molded so that a juncture between at least two surfaces thereof is rounded;
drawing a portion of tissue to be ligated through the central opening of the elastic band;
releasing the elastic band so that the size of the central opening decreases to grip the tissue received therein.

US 6,409,738 B2
CASTRATION TOOL AND METHOD
Michael P. Callicrate, PO Box 748, St. Francis, Kans. 67756
Division of application No. 09/392,695, filed on Sep. 9, 1999, now Pat. No. 6,270,507, which is a division of application No. 09/126,685, filed on Jul. 30, 1998, now Pat. No. 5,997,553, which is a division of application No. 08/938,326, filed on Sep. 26, 1997, now Pat. No. 5,843,095, which is a continuation-in-part of application No. 08/414,638, filed on Apr. 3, 1995, now Pat. No. 5,681,329, and a division of application No. 07/807,727, filed on Dec. 16, 1991, now Pat. No. 5,236,434, which is a continuation-in-part of application No. 08/086,806, filed on Jul. 2, 1993, now Pat. No. 5,403,325. This application Jun. 6, 2001, Appl. No. 875,825.
This patent is subject to a terminal disclaimer.
Int. Cl. A61B *17/10*
U.S. Cl. 606—141 **6 Claims**



1. A device for ligating a body part, comprising:
an elongated tool body having a forward end and a rearward end, said rearward end having a handle and said forward end having an opening through which a preformed endless loop of elastomeric ligature material may be passed;
a means for pulling said ligature material towards said rearward end of said tool body, said means for pulling interconnected to said tool body, said pulling means comprising a caukling gun-type mechanism; and
a lever pivotally mounted on said tool body for deforming a grommet positioned in or adjacent to said rerward end, said lever pivoted towards an animal being ligated and moved along an elongated axis of said elongated tool body.

US 6,409,739 B1
DEVICE AND METHOD FOR ASSISTING END-TO SIDE ANASTOMOSIS
Anthony A. Nobles, Fountain Valley, and Naoum A. Baladi, Redwood City, both of Calif., assignors to Cardio Medical Solutions, Inc., Santa Ana, Calif.
Continuation-in-part of application No. 05/944,730, filed on Mar. 6, 1998, Provisional application No. 06/046,972, filed on May 19, 1997. This application May 1, 1998, Appl. No. 71,462.
This patent is subject to a terminal disclaimer.
Int. Cl. A61B *17/08*
U.S. Cl. 606—148 **20 Claims**



1. A device for creating a seal around an incision in a blood vessel which allows blood to flow through the blood vessel, comprising:
a tube;
a shaft slidably mounted within said tube;
a retaining member which prevents relative movement between said shaft and said tube, said retaining member being releasable to allow said relative movement;
a deformable sealing member adjoining distal ends of said shaft and said tube, said sealing member being reversibly adjustable, between:
an elongated, narrow configuration for insertion of said sealing member through the incision; and
a sealing configuration in which (i) a first portion of said sealing member seals against an inner wall of the blood vessel, and (ii) a second portion of said sealing member, interior to said first portion, is spaced from the inner wall of the blood vessel to form a cavity which provides a region of hemostasis within the blood vessel;
wherein the configuration of said sealing member is changed by movement of said shaft relative to said tube.

US 6,409,740 B1

BLOOD LANCET SYSTEM FOR WITHDRAWING BLOOD FOR DIAGNOSTIC PURPOSES

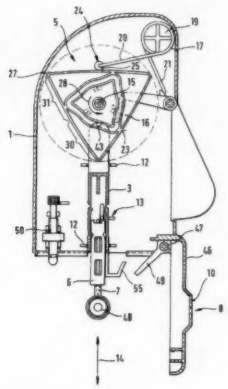
Hans-Jurgen Kuhr, Mannheim, and Herbert Argauer, Pirk, both of Germany, assignors to Roche Diagnostics GmbH, Mannhein, Germany

Filed Oct. 2, 2000, Appl. No. 677,726

Claims priority, application Germany, Oct. 9, 1999, 199 48 759

Int. Cl. A61B *17/14*

U.S. Cl. 606—182 28 Claims



1. Blood lancet device for withdrawing blood from a body part for diagnostic purposes, comprising

a housing with an outlet opening for a tip of a lancet and a contact surface around the outlet opening for contacting to the body part,

a lancet holder for holding the lancet and movable within the housing along a predetermined puncturing path,

a lancet guide guiding the lancet holder along the predetermined puncturing path,

a lancet drive with a drive rotor driven by a drive spring in a sense of rotation, by which lancet drive a relaxation movement of the drive spring is converted into a pricking movement during which the lancet held by the lancet holder moves with high speed along the predetermined puncturing path in a pricking direction, until its tip protrudes from the outlet opening and a wound is generated at the body part contacting the contact surface and by which lancet drive the lancet holder is retracted to a position where the tip of the lancet is within the housing,

wherein

the drive rotor has a pressure surface which is directed radially outwardly and runs with varying center distance around the rotation axis in such a manner that it has a vertex with maximum center distance, and a propelling section following the vertex against the sense of rotation, with a center distance decreasing against the sense of rotation,

the drive spring is adapted for effecting in a propelling angle section of the rotation of the drive rotor via a pressure element a pressure with a component in radial direction to the rotation axis onto the propelling section of the pressure surface, thus driving the drive rotor by the pressure of the drive spring onto the pressure surface in the propelling section in the sense of rotation, and

the drive rotor is coupled via an output-side coupling mechanism with the lancet holder, in such a manner that the tip of the lancet protrudes from the outlet opening at a point of time in which the drive rotor is in the propelling angle section.

US 6,409,741 B1

FOCALIZED INTRALUMINAL BALLOONS

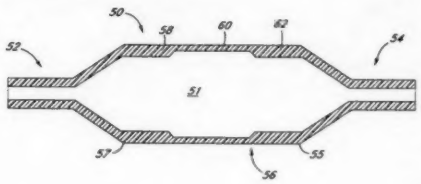
Michael Crocker, Anaheim, and Lynn M. Shimada, Irvine, both of Calif., assignors to Adiance Medical Systems, Inc., Irvine, Calif.

Continuation of application No. 09/203,228, filed on Nov. 30, 1998, now Pat. No. 6,120,523, which is a continuation of application No. 08/742,437, filed on Oct. 30, 1996, now Pat. No. 5,843,116, which is a continuation-in-part of application No. 08/640,533, filed on May 2, 1996, now Pat. No. 5,645,560, which is a continuation-in-part of application No. 08/572,783, filed on Dec. 15, 1995, now abandoned. This application May 3, 2000, Appl. No. 564,003.

This patent is subject to a terminal disclaimer.

Int. Cl. A61M *29/00*

U.S. Cl. 606—192 10 Claims



1. A multiple zone balloon catheter, in combination with an expandable intraluminal stent, comprising:

an elongate flexible tubular body;

an inflatable balloon mounted on the tubular body;

a first zone on the balloon, inflatable to a first inflated diameter at a first inflation pressure;

a second zone on the balloon, inflatable to a second inflated diameter at the first inflation pressure, said second inflated diameter greater than said first inflated diameter;

a third zone on the balloon, inflatable to the first inflated diameter at the first inflation pressure, wherein the second zone is disposed intermediate the first zone and the third zone; and

an expandable intraluminal stent removably positioned on at least the second zone of the balloon.

US 6,409,742 B1

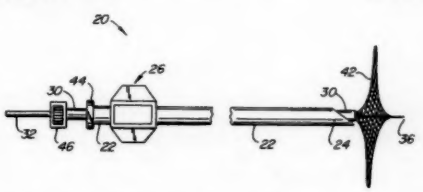
TARGET TISSUE LOCALIZATION DEVICE AND METHOD

Richard Eustis Fulton, III, Grand Junction, Colo., and William R. Dubrul, Redwood City, Calif., assignors to Artemis Medical, Inc., Hayward, Calif.

Continuation of application No. 09/376,678, filed on Aug. 18, 1999, now Pat. No. 6,179,860, Provisional application No. 60/097,126, filed on Aug. 19, 1998, Provisional application No. 60/106,733, filed on Nov. 2, 1998. This application Oct. 2, 2000, Appl. No. 678,508.

Int. Cl. A61M *29/00*

U.S. Cl. 606—200 12 Claims



1. A target tissue localization device, for localizing target tissue within a soft tissue region of a patient, comprising:

an elongate placement device comprising:

a first member having a distal portion; and

a second member carried by the first member and being longitudinally movable relative thereto;

an anchor having first and second portions secured to the first and second members, respectively;

said anchor movable from a first, radially contracted configuration to a second, radially expanded configuration;

said anchor having first and second cross-sectional areas, lying in relatively radially-oriented planes, when in the first and second configurations, said second area being at least four times said first area; and

said placement device and anchor being sized and configured for use in localization of target tissue.

US 6,409,743 B1

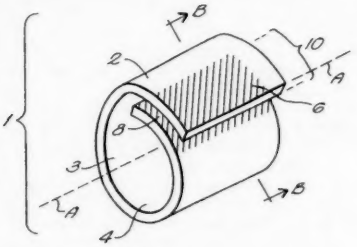
DEVICES AND METHODS FOR SECURING SUTURES AND LIGATURES WITHOUT KNOTS

Paul V. Fenton, Jr., Marblehead, Mass., assignor to Axya Medical, Inc., Beverly, Mass.

Provisional application No. 60/092,073, filed on Jul. 8, 1998, Provisional application No. 60/092,074, filed on Jul. 8, 1998. This application Jul. 8, 1999, Appl. No. 349,663.

Int. Cl. A61B *17/04*

U.S. Cl. 606—232 **46 Claims**



1. A device for securing one or more elongated members, comprising:

a collar having a C-shape, said collar being disposed about a central region, said central region extending along a central axis for containing at least a portion of said elongated members aligned with said central axis, wherein said collar extends circumferentially between two end portions, said collar having an innermost surface and an outermost surface, said surfaces extending between said end portions,

said collar being resilient so that after cessation of a deforming force, said collar returns to substantially said C-shape, is made of a flexible, fusible material, and wherein said collar is deformable into a nominally closed position so that said end portions of said collar overlap so that regions of said innermost surface and said outermost surface are opposite each other forming overlapping portions, wherein the surfaces of said overlapping portions are substantially smooth and wherein the amount of overlapping is selectively adjustable and wherein said overlapping portions of said collar are adapted to fuse to each other around said central region upon application of sufficient energy to at least one of said overlapping portions of said collar.

US 6,409,744 B1

HUMAN-BODY IRRADIATION DEVICE FOR DEEP TREATMENT OF TISSUES

Fabio Paolo Marchesi, Via Tadino, 13, 20124 Milan, Italy

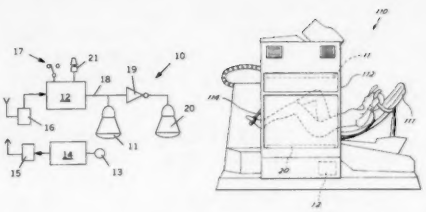
Filed Feb. 18, 2000, Appl. No. 507,160

Claims priority, application Italy, Feb. 19, 1999, MI99A0339

Int. Cl. A61F *7/00*

U.S. Cl. 607—96 **16 Claims**

1. A device for emission of red/infrared light radiation for treatment of the human body comprising red/infrared lamps and lamp-emission modulating means which modulates the red/infrared



emission between a low level and a high level with a modulation period included between 0.1 and 20 seconds, the high-level duration being included between ⅔ and ⅘ of the modulation period.

US 6,409,745 B1

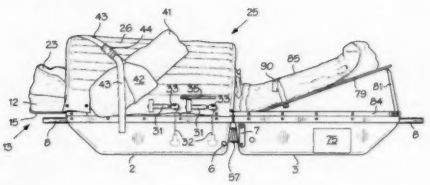
FIELD-DEPLOYABLE FORCED AIR WARMING SYSTEM

Michel B. Ducharme, Kettleby, and John Frim, Bramalea, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Dec. 14, 2000, Appl. No. 735,803

Int. Cl. A61F *7/00*

U.S. Cl. 607—108 **13 Claims**



1. A portable apparatus for warming a hypothermia victim comprising a stretcher, said stretcher including a bottom wall, side walls and end walls contiguous with each other; a support extending between said side walls for supporting the torso of a hypothermia victim above and spaced apart from the bottom wall of the stretcher; openings in said support permitting the circulation of warm air around the torso of the victim, a canopy for covering the torso of the victim and defining a heating chamber around the torso with said stretcher; heating ducts in said chamber for discharging warm air against the torso of the victim, whereby the warm air circulates through said openings around the torso; and a forced air heater for warming ambient air, and delivering the warm air to the heating ducts.

US 6,409,746 B1

EYE PILLOW

Michihito Igaki; Takeshi Oka; Tadayuki Tokunaga, and Shinichi Sato, all of Tokyo, Japan, assignors to Kao Corporation, Tokyo, Japan

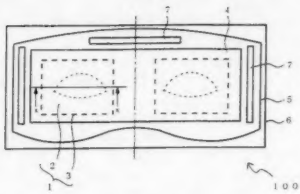
Filed Oct. 6, 2000, Appl. No. 679,542

Claims priority, application Japan, Oct. 7, 1999, 11-287435; Dec. 27, 1999, 11-371966; Sep. 5, 2000, 2000-269305

Int. Cl. A61F *7/00*

U.S. Cl. 607—109 **7 Claims**

1. An eye pillow applied to the eyes and the area around the eyes, comprising a steam-generating unit that uses chemical energy, wherein steam at 50° C. or lower is released from the

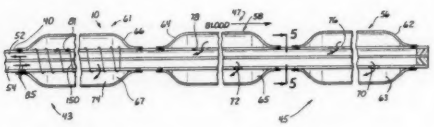


surface of the eye pillow applied to the eyes and the area around the eyes and the total weight of the eye pillow is 50 g or more.

US 6,409,747 B1
INDWELLING HEAT EXCHANGE CATHETER AND METHOD OF USING SAME

Yves Pierre Gobin, Los Angeles; Scott Evans, Santa Ana; Mike Jones, Capistrano Beach, and Wayne Noda, Mission Viejo, all of Calif., assignors to Alsius Corporation, Irvine, and The Regents of the University of California, Berkely, both of Calif.

Continuation of application No. 09/063,984, filed on Apr. 21, 1998, now Pat. No. 6,126,684. This application Feb. 11, 2000, Appl. No. 503,014.
This patent is subject to a terminal disclaimer.
Int. Cl. A61B *17/24*
U.S. Cl. 607—113 **7 Claims**



1. A catheter comprising:

a shaft having an axis extending between a proximal end and a distal end, the shaft having at least one input lumen and at least one output lumen;

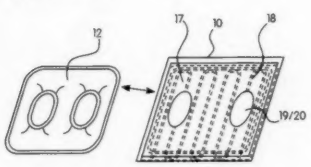
a heat exchange region disposed substantially at the distal end of the shaft and including at least a first balloon and at least a second balloon each having an outer surface;

the input lumen of the shaft being coupled to the first balloon at a first location, and the output lumen of the shaft being coupled to the first balloon at a second location so that a heat exchange fluid introduced into the input lumen will enter the first balloon at the first location and will exit the first balloon at the second location through the output lumen.

US 6,409,748 B1
HEATING PAD WITH REMOVABLE GEL PACK

Arnold V. DeCarlo, Manhattan, and Robert Czajkowski, Tinley Park, both of Ill., assignors to Sunbeam Products, Inc., Boca Raton, Fla.

Filed Nov. 16, 1999, Appl. No. 441,282
Int. Cl. A61F *7/00*
U.S. Cl. 607—114 **33 Claims**



1. A heating pad comprising:

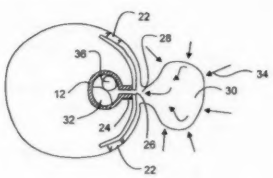
a heating pad member comprising a cover and electrical heating coils, said cover comprising a first layer and a second layer, said first layer being an inner layer, and said second layer being an outer layer, each layer comprising a flexible fabric material and having a plurality of sides being permanently secured together, wherein the electrical heating coils are enclosed by the cover and substantially evenly distributed therewithin; and

a removable gel pack member having an outer surface for contacting an anatomical portion of a subject, said removable gel pack member being releasably attached to said first layer of the cover of the heating pad member and comprising a heat-retentive gel which is heated to a predetermined temperature prior to attachment to the first layer of the cover of the heating pad member, wherein said pre-determined temperature is substantially maintained during application to the subject after said attachment by operating the electrical heating coils.

US 6,409,749 B1
ANEURISM PATCH INCLUDING DISTRIBUTED ACTIVATOR FOR A TWO-DIMENSIONAL SHAPE MEMORY ALLOY

Ronald S. Maynard, 777 Hollebeck, #15Q, Sunnyvale, Calif. 94087

Division of application No. 08/756,099, filed on Nov. 25, 1996, now Pat. No. 5,941,249, which is a continuation-in-part of application No. 08/708,586, filed on Sep. 5, 1996, now Pat. No. 6,133,547. This application Jul. 7, 1999, Appl. No. 349,411.
Int. Cl. A61F *2/06*
U.S. Cl. 623—1.1 **24 Claims**



1. An aneurism patch apparatus for treating an aneurism formed in a vessel, comprising:

a patch including a vessel interface side and an opposing non-interface side, the patch being formed of a sufficiently flexible material to provide a patch stowed state when the patch is delivered through the vessel and a patch deployed state when the patch is at least partially positioned over the mouth of the aneurism, the interface side of the patch being configured to form an adherence between the patch and an area of a vessel wall adjacent to the aneurism mouth, wherein the adherence maintains a fixed position of the patch relative to the aneurism mouth, and wherein the patch includes an aperture configured to be coupled to a low pressure source.

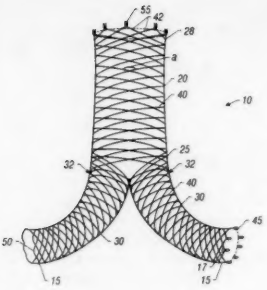
US 6,409,750 B1
WOVEN BIFURCATED AND TRIFURCATED STENTS AND METHODS FOR MAKING THE SAME

Hideki Hyodoh, Sapporo, Japan; Andras Konya, and Kenneth C. Wright, both of Houston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Provisional application No. 60/118,185, filed on Feb. 1, 1999, Provisional application No. 60/125,192, filed on Mar. 18, 1999. This application Feb. 1, 2000, Appl. No. 495,984.
Int. Cl. A61F *2/06*
U.S. Cl. 623—1.1 **36 Claims**

1. A device suitable for implantation into an anatomical structure, comprising:

a first plurality of wires defining a first leg, the first leg having a first distal portion;



a second plurality of wires defining a second leg, the second leg having a second distal portion; and

a common body having a distal end and a proximal portion, the common body being formed from at least the first and second pluralities of wires, the proximal portion of the common body being adjacent to the distal portions of both legs, and both ends of at least one wire from one of the pluralities being located proximate the distal end of the common body.

US 6,409,751 B1

STENT DELIVERY SYSTEM AND METHOD OF USE

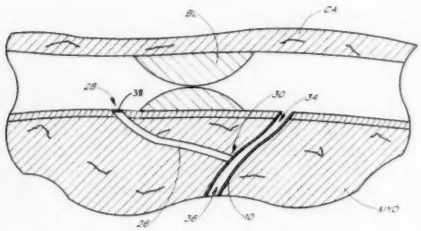
Todd A. Hall, Goshen; Greg R. Furnish; Simon M. Furnish, both of Louisville, all of Ky.; Scott J. Wolf, Minneapolis, Minn.; Peter J. Wilk, New York, N.Y.; David Y. Phelps, Louisville, Ky., and Vincent Pompili, Carmel, Ind., assignors to Percardia, Inc., Nashua, N.H.

Continuation of application No. 09/150,181, filed on Sep. 10, 1998, now Pat. No. 6,196,230. This application Nov. 14, 2000, Appl. No. 710,884.

This patent is subject to a terminal disclaimer.

Int. Cl. A61F *2/06*

U.S. Cl. 623—1.11 **17 Claims**



1. A method for creating a bypass through the myocardium of a patient to bypass a blockage formed in a coronary artery, comprising:

creating a first tunnel through the myocardium having a proximal end and a distal end, the proximal end opening into the coronary artery proximal to the blockage, and the distal end positioned within the myocardium;

creating a second tunnel through the myocardium, the second tunnel having a first branch extending from the distal end of the first tunnel and opening into the coronary artery at a position distal to the blockage, and a second branch extending from the distal end of the first channel and opening into the left ventricle; and

disposing a stent in the second tunnel to provide a myocardial passageway therethrough.

US 6,409,752 B1

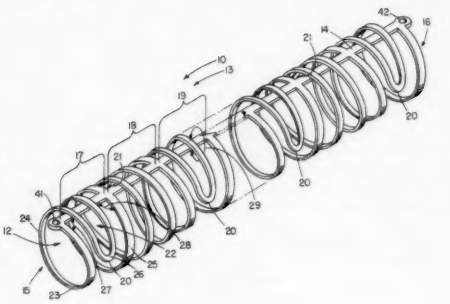
FLEXIBLE STENT HAVING A PATTERN FORMED FROM A SHEET OF MATERIAL

Scott E. Boatman, Bloomington, and Kimberly D. Brummett, Springville, both of Ind., assignors to Cook Incorporated, Bloomington, Ind.

Continuation of application No. 08/378,073, filed on Jan. 25, 1995, now Pat. No. 5,632,771, which is a continuation of application No. 08/097,392, filed on Jul. 23, 1993, now abandoned. This application Nov. 13, 1996, Appl. No. 748,669.

Int. Cl. A61F *2/06*

U.S. Cl. 623—1.15 **23 Claims**



1. A stent comprising:

a member having opposite free ends and formed of a sheet of biocompatible material having a pattern in a surface of said sheet, said pattern including in said sheet a plurality of cells, said pattern further including an eyelet at at least one of said free ends of said member, said eyelet being of a fixed size smaller than a respective said cell, and wherein a radiopaque marker is positioned in said eyelet to clearly indicate a location of the at least one free end.

US 6,409,753 B1

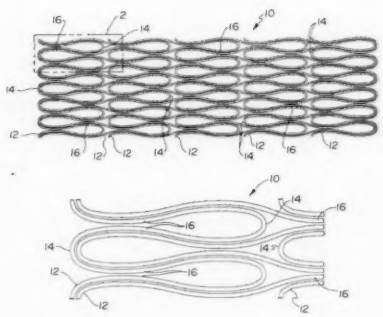
FLEXIBLE STENT

Brian J. Brown, Hanover, and Timothy J. Ley, Shoreview, both of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.

Filed Oct. 26, 1999, Appl. No. 426,479

Int. Cl. A61F *2/06*

U.S. Cl. 623—1.15 **7 Claims**



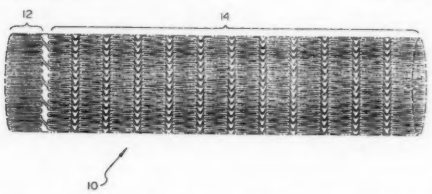
1. A flexible expandable stent comprised of a plurality of serpentine-like rings loosely interfitted in mated relationship with adjacent serpentine rings to form a mesh-like cylindrical stent body, wherein each ring is comprised of a plurality of segments including wide and narrow portions, the wide portions of the

serpentine-like rings being interfitted into the wide portions of the adjacent serpentine ring, the rings being unconnected with each other.

US 6,409,754 B1
FLEXIBLE SEGMENTED STENT
Scott R. Smith, Chaska, and Douglas P. Killion, Maple Grove, both of Minn., assignors to Scimed Life Systems, Inc., Maple Grove, Minn.
Filed Jul. 2, 1999, Appl. No. 346,826
Int. Cl. A61F *2/06*
U.S. Cl. 623—1.16 **30 Claims**

1. A segmented stent comprising a plurality of generally annular and radially expandable stent segments, segments which are adjacent to one another being interconnected by at least one interconnector element of a plastically deformable material wherein the stent segments are made of a material which does not exhibit permanent deformation.

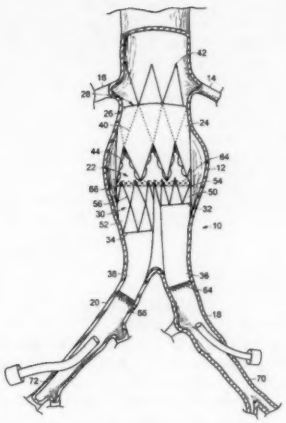
US 6,409,755 B1
BALLOON EXPANDABLE STENT WITH A SELF-EXPANDING PORTION
Anthony C. Vrba, Maple Grove, Minn., assignor to Scimed Life Systems, Inc., Maple Grove, Minn.
Continuation of application No. 09/087,526, filed on May 29, 1997, now Pat. No. 6,168,621. This application Nov. 9, 2000, Appl. No. 710,520.
This patent is subject to a terminal disclaimer.
Int. Cl. A61F *2/06*
U.S. Cl. 623—1.2 **21 Claims**



1. A stent comprising at least a first portion which is self-expandable; a second portion which is balloon expandable and not self-expandable, the second portion connected to the first portion;
a first serpentine band which defines a first path about a lint circumference of the stent, the first path characterized by a first path length; and
a second serpentine band which defines a second path about a second circumference of the stent, the second path characterized by a second path length,
the first path length exceeding the second path length.

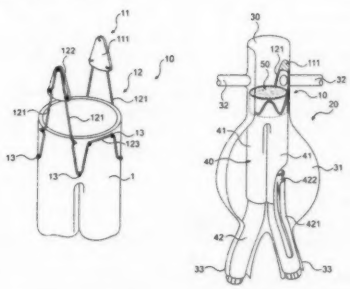
US 6,409,756 B1
ENDOVASCULAR AORTIC GRAFT
Edward G. Murphy, 6035 E. Sage Dr., Scottsdale, Ark. 85253
Filed Jan. 24, 2000, Appl. No. 489,401
Int. Cl. A61F *2/06*
U.S. Cl. 623—1.35 **17 Claims**

16. An arterial interluminal prosthesis for repairing an aortic aneurysm of a patient comprising:



a main body having a first end with an upper aperture for being located proximate to renal arteries of the patient and a second end having two lower apertures for being located in the aortic artery proximate iliac arteries of the patient;
a first leg separate from the main body for inserting into one of the two lower apertures of the main body to extend therefrom into one of the iliac arteries;
a second leg separate from the main body for inserting into the other of the two lower apertures of the main body to extend therefrom into the other of the iliac arteries;
a first stent located entirely within the main body proximate the first end and a second stent coupled at the first end of the main body to extend therefrom across the renal arteries of the patient; and
a plurality of stents coupled to the outer surface of the main body, wherein at least one of such stents is located proximate the second end of the main body and the at least one other of such stents is coupled to the first stent.

US 6,409,757 B1
METHOD AND APPARATUS FOR SUPPORTING A GRAFT ASSEMBLY
Hugh H. Trout, III, Bethesda, Md., and Howard M. Tanner, Logan, Utah, assignors to Eva Corporation, Bethesda, Md.
Filed Sep. 15, 1999, Appl. No. 396,513
Int. Cl. A61F *2/06*
U.S. Cl. 623—1.36 **18 Claims**



1. A support device for supporting a graft assembly within a vessel, wherein the graft assembly includes a tubular portion having a proximal end, said support device comprising:
attachment means for attaching the graft assembly to a vessel wall of the vessel, wherein said attachment means comprises at least one attachment assembly;

fastening means for fastening said attachment means to the vessel wall, wherein a portion of said fastening means penetrates said attachment means and the vessel wall and secures said attachment means to the vessel wall;

connecting means for connecting said attachment means to the proximal end of the graft assembly, whereby said attachment means is spaced from the proximal end of the graft assembly, wherein said connecting means includes a support system that extends from said attachment means to the proximal end of the graft assembly; and

securing means for securing said connecting means to the proximal end of the graft assembly.

US 6,409,758 B2

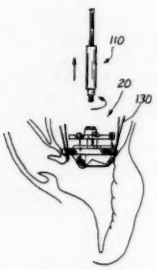
HEART VALVE HOLDER FOR CONSTRICTING THE VALVE COMMISSURES AND METHODS OF USE

Robert Stobie, Mission Viejo; Jerry L. Jackman, Tustin; Cuong Ton-That, Irvine; C. Roger Ekholm, Rancho Santa Margarita, and Steve Newborg, Riverside, all of Calif., assignors to Edwards Lifesciences Corporation, Irvine, Calif.

Continuation-in-part of application No. 09/626,570, filed on Jul. 27, 2000, now abandoned. This application Dec. 21, 2000, Appl. No. 746,431.

Int. Cl. A61F *2/06*

U.S. Cl. 623—2.11 **18 Claims**



1. A combination holder and tissue-type prosthetic mitral heart valve attachable to a surgical delivery handle, the heart valve having an inflow end and an outflow end and a flow axis therebetween, the valve including an annular suture ring at the inflow end and radially flexible commissure posts circumferentially-spaced around the outflow end that support occluding tissue surfaces of the valve, the holder comprising:

a commissure post constriction mechanism releasably attached to the suture ring at the inflow end of the valve, the mechanism adapted to constrict the valve commissure posts radially inward from a relaxed position to a constricted position when actuated by the delivery handle, and

a retaining mechanism that retains the commissure post constriction mechanism in the constricted position after the delivery handle is removed.

US 6,409,759 B1

HARVESTED TISSUE HEART VALVE WITH SEWING RIM

Mario Osvaldo Vrandecic Peredo, Belo Horizonte, Brazil, assignor to St. Jude Medical, Inc., St. Paul, Minn.

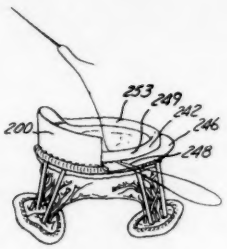
Filed Dec. 30, 1999, Appl. No. 475,525

Int. Cl. A61F *2/24*

U.S. Cl. 623—2.13 **28 Claims**

1. A heart valve prosthesis comprising:

a harvested tissue heart valve with integral leaflets, the heart valve having an annulus at one end of the valve; and



a sewing rim having an extension of material extending outwardly from the surface of the annulus.

US 6,409,760 B1

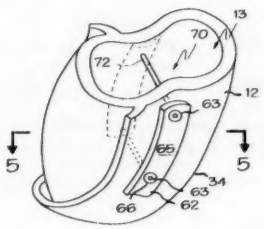
DEVICE AND METHOD FOR RESTRUCTURING HEART CHAMBER GEOMETRY

David B. Melvin, Loveland, Ohio, assignor to University of Cincinnati, Cincinnati, Ohio

Continuation of application No. 09/035,710, filed on Mar. 5, 1998. This patent is subject to a terminal disclaimer.

Int. Cl. A61F *2/24*

U.S. Cl. 623—3.1 **50 Claims**



1. A static device for use with a heart having at least one chamber, said device comprising:

a plurality of members configured to be positioned adjacent the epicardial surface of the heart; and

a connector joining the members;

wherein said device is positioned in a spaced relationship relative to each other to reconfigure the chamber of the heart as at least two contiguous communicating portions of truncated ellipsoids.

US 6,409,761 B1

INTRAVASCULAR STENT

G. David Jang, 30725 Eastburn La., Redlands, Calif. 02374

Continuation of application No. 08/824,142, filed on Mar. 26, 1997, now Pat. No. 6,241,760, Provisional application No. 60/017,484, filed on Apr. 26, 1996. This application Apr. 20, 2001, Appl. No. 839,442.

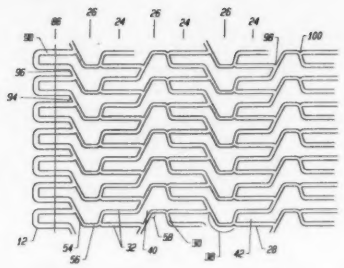
Int. Cl. A61F *2/06*

U.S. Cl. 623—6.12 **2 Claims**

1. A stent in a non-expanded state, comprising:

a first column expansion strut pair formed of a first expansion strut and a second expansion strut that is parallel to the first expansion strut, the first and second expansion struts being coupled by a substantially linear joining strut that is joined to each of the first and second expansion struts at a non-perpendicular angle, a plurality of the first column expansion strut pair forming a first expansion column;

a second column expansion strut pair formed of a first expansion strut and a parallel second expansion strut, the first and



second expansion struts being coupled by a substantially linear joining strut that is joined to each of the first and second expansion struts at a non-perpendicular angle, a plurality of the second column expansion strut pair forming a second expansion column; and

a plurality of first serial connecting struts forming a first connecting strut column, the plurality of first serial connecting struts coupling the first expansion column to the second expansion column, a first connecting strut in the first connecting strut column having a proximal stem that includes curvature, a distal portion with a distal stem that includes curvature and an intermediate portion that couples the proximal and distal portions; and

wherein the first expansion column, the second expansion column, and the first connecting strut column forming a plurality of symmetrical geometric cells.

US 6,409,762 B1

FLEXIBLE MONOBLOC INTRAOCULAR LENS

Joël Pynson, Toulouse, and Florian David, Balma, both of France, assignors to Chauvin Opsia, Z.A.C., Castanet Tolosan, France

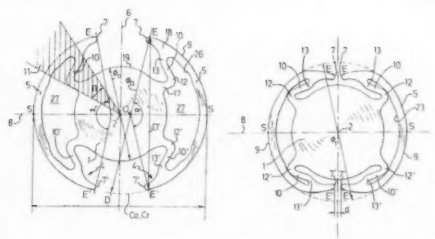
PCT No. PCT/EP99/00589, § 371 Date Sep. 19, 2000, § 102(e) Date Sep. 19, 2000, PCT Pub. No. WO99/48442, PCT Pub. Date Sep. 30, 1999

PCT Filed Mar. 16, 1999, Appl. No. 646,463

Claims priority, application France, Mar. 20, 1998, 98.03461

Int. Cl. A61F *2/16*

U.S. Cl. 623—6.39 **35 Claims**



1. A monobloc intraocular lens made of a flexible material which can be folded or rolled, but which is sufficiently elastic so that the lens regains, after being implanted in an ocular housing with a mean diameter equal to ϕm, a functional shape corresponding to its initial shape, comprising a central optic part (**1**) in the shape of a disc having an optical axis (**2**) and defining a principal plane of the lens (**3**) perpendicular to the optical axis (**2**), and a haptic part (**4**) comprising

two loops (**5**) adapted to contact with an inner wall of the eye, each of these contact loops (**5**) having an external surface (**9**) with a generally convex-shaped curve with a convexity directed outwards radially with respect to the optic part (**1**),

for each contact loop (**5**), two linking elements (**10**, **10'**) extending between the optic part (**1**) and the contact loop (**5**), the lens having, seen in plan, and before implantation, an initially overall symmetrical shape with respect to two perpendicular axes of symmetry contained within the principal plane (**3**), the so-called horizontal principal axis (**8**) and vertical principal axis (**6**),

the external surface (**9**) of each contact loop (**5**) having a trace in the principal plane (**3**) which has a generally convex-shaped curve defining an apex (S) of intersection with the horizontal principal axis (**8**), and two points, referred to as end points (E, E'), equidistant from the horizontal principal axis (**8**) between which the radius of curvature is always greater than 2.5 mm,

wherein:

the circle (Ca) passing through the apex (S) and the two end points (E, E') of each contact loop (**5**) has a diameter ϕa greater than or equal to ϕm and less than ϕm+1.5 mm,

the apices (S) of the two contact loops (**5**) are separated from each other by a distance D different from ϕa and greater than ϕa,

the linking elements (**10**, **10'**) are adapted so that they can be deformed in flexion in the principal plane (**3**) in the direction of a reduction in the radial dimensions of the lens by bringing the contact loops (**5**) towards each other and the optic part (**1**), while preserving the symmetry of the lens with respect to the two horizontal (**8**) and vertical (**6**) principal axes, and at least substantially without deformation or displacement of the optic part (**1**), so that the lens can be adapted to a radial retraction of the ocular housing.

US 6,409,763 B1

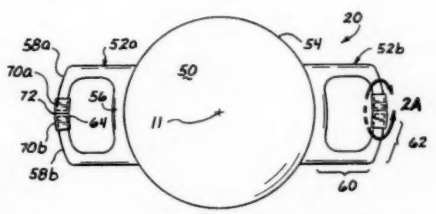
IRIS-SUPPORTED INTRAOCULAR LENSES OPTICS AND RIGID FIXATION MEMBERS

Daniel G. Brady, San Juan Capistrano, Calif., assignor to Allergan Sales, Inc, Irvine, Calif.

Filed Aug. 30, 2001, Appl. No. 943,558

Int. Cl. A61F *2/16*

U.S. Cl. 623—6.43 **23 Claims**



1. An iris-supported intraocular lens for implantation in the anterior chamber of an eye, the intraocular lens comprising:

an optic centered on an optical axis;

at least two fixation members extending outward from the optic, each fixation member defining a pair of separated pincer arms that converge toward one another and terminate at aligned end tips to form a gap therebetween; and

at least one compliant sleeve covering one of the pincer arm tips and filling the gap.

US 6,409,764 B1

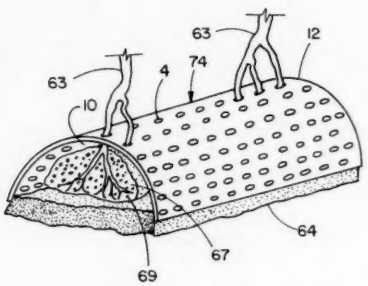
METHODS AND ARTICLES FOR REGENERATING BONE OR PERIDONTAL TISSUE

Charles F. White, P.O. Box 825, Camp Verde, Ariz. 86322; Charles Flynn, 740 E. Mingus Ave., Apt. 2039, Cottonwood, Ariz. 86326; Alonzo D. Cook, 1665 W. University Heights Dr. S.; William R. Hardwick, 41 Pine Cone Dr., both of Flagstaff, Ariz. 86001; Ulf M. E. Wikesjo, 518 Morris Ave., Bryn Mawr, Pa. 19010, and Robert C. Thomson, 623 N. Leroux St., Flagstaff, Ariz. 86001

Filed Dec. 3, 1998, Appl. No. 205,150

Int. Cl. A61F *2/28;* **A61C** *13/00*

U.S. Cl. 623—16.11 **65 Claims**



1. A method of generating living bone having desired configuration in a mammal, said method comprising:

providing a tissue penetrable device comprising portions having a plurality of holes therethrough, wherein said holes permit cells and vascular structures to grow through said tissue penetrable device, said tissue penetrable device having mechanical properties that allow the device to be configured into a desired form and retained substantially in said desired form;

establishing a space with said tissue penetrable device in a mammal in such a way that a boundary is at least partially formed by said tissue penetrable device between said space and anatomical structures of said mammal surrounding said space, wherein said space has essentially the same conjuration as bone to be generated therein;

placing at least one TGF-Beta protein in said space;

allowing cells and blood vessels from said mammal to traverse said tissue penetrable device through said holes into said space; and

generating bone in said space.

US 6,409,765 B1

OPEN INTERVERTEBRAL SPACER

John R. Bianchi; Kevin C. Carter, both of Gainesville, Fla.; Bradley T. Estes; Larry Boyd, both of Memphis, Tenn., and John A. Pafford, Germantown, Tenn., assignors to SDGI Holdings, Inc., Wilmington, Del., and University of Florida Tissue Bank, Inc., Aluchua, Fla.

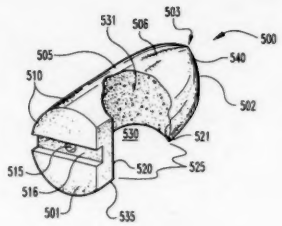
Continuation of application No. 08/867,963, filed on Jun. 3, 1997, now Pat. No. 6,033,438. This application Dec. 3, 1999, Appl. No. 453,787.

This patent is subject to a terminal disclaimer.

Int. Cl. A61F *2/44*

U.S. Cl. 623—17.11 **40 Claims**

1. A graft consisting essentially of cortical bone and comprising an elongated body having an outer surface and a longitudinal axis along a length of said body, said outer surface including a channel



having a substantially convex surface and extending along a second axis substantially perpendicular to said longitudinal axis.

US 6,409,766 B1

COLLAPSIBLE AND EXPANDABLE INTERBODY FUSION DEVICE

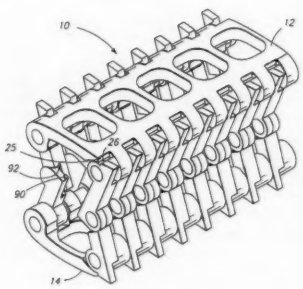
Darrell C. Brett, Portland, Oreg., assignor to Expanding Concepts, LLC, Portland, Oreg.

Continuation of application No. 09/350,984, filed on Jul. 9, 1999, now Pat. No. 6,126,689, Provisional application No. 60/094,732, filed on Jul. 30, 1998. This application Aug. 9, 2000, Appl. No. 635,364.

This patent is subject to a terminal disclaimer.

Int. Cl. A61F *2/44*

U.S. Cl. 623—17.16 **17 Claims**



1. An interbody fusion cage comprising:

a) an upper body and a lower body;

b) at least one articulated support connecting said upper body to said lower body;

c) an interior region defined by said upper body, said lower body, and said at least one articulated support; and

d) said at least one articulated support having an expanded position and a collapsed position, said at least one articulated support folding inward toward the interior region as said at least one articulated support goes from said expanded position to said collapsed position.

US 6,409,767 B1

ANKLE PROSTHESIS

Ramon Viladot Pericé, Barcelona, Spain; Greta Dereymaeker, Oud-Heverlee, Belgium; Patrice Franåois Diebold, Nancy, France, and Beat Hintermann, Rienen, Switzerland, assignors to European Foot Platform, Nancy, France

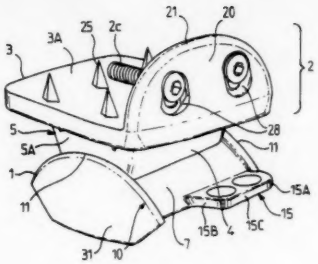
Filed Nov. 3, 2000, Appl. No. 704,765

Claims priority, application France, Nov. 5, 1999, 99 14198

Int. Cl. A61F *2/42*

U.S. Cl. 623—21.18 **19 Claims**

1. An ankle prosthesis comprising:



a talus implant for implanting in or on a talus and a top element having a tibia implant for implanting in or on the base of a tibia,

said top element and said talus implant being mounted to move relative to each other by friction on a contact interface to allow movement,

wherein said contact interface presents a friction surface having a shape which is a fraction of a substantially frustoconical surface, said friction surface being oriented so that its larger radius portion is directed substantially towards the outside of an ankle when the prosthesis is in place,

wherein said top element further includes an intermediate implant, having two opposite faces, which is interposed between said tibia implant and said talus implant, said intermediate implant being in free contact by relative friction with said talus implant and said tibia implant via said two opposite faces, and

wherein said intermediate implant is in sliding contact with said tibia implant via a plane top face, and in sliding contact with said fraction of a substantially frustoconical surface via a bottom face having a shape which is complementary to said fraction of a substantially frustoconical surface.

US 6,409,768 B1

SCREW ANCHORED JOINT PROSTHESIS

Slobodan Tepic, Rigistrasse 27 B, Zurich, Switzerland, CH-8006, and W. Andrew Hodge, 8260 Native Dancer Rd. E., Palm Beach Gardens, Fla. 33418

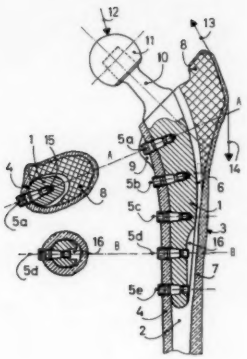
Filed Mar. 16, 2000, Appl. No. 527,319

Int. Cl. A61F *2/32*

U.S. Cl. 623—23.27 **45 Claims**

1. An orthopaedic implant system for implantation in a patient's bone, the system comprising:

an orthopaedic implant comprising an intraosseous portion, the intraosseous portion having:



a first side

a second side; and

at least one screw hole, the screw hole having an internally-threaded portion;

at least one bone screw having:

an externally-threaded front end for engagement with the internally-threaded portion of the screw hole; and

an externally-threaded head for engagement with the bone.

US 6,409,769 B1

KINETIC RESOLUTION OF OLEFINS

Yian Shi, Fort Collins, Colo., assignor to Colorado State University Research Foundation, Fort Collins, Colo.

PCT No. PCT/US99/08418, § 371 Date Dec. 4, 2000, § 102(e) Date Dec. 4, 2000, PCT Pub. No. WO99/52886, PCT Pub. Date Oct. 21, 1999

Provisional application No. 60/082,029, filed on Apr. 16, 1998. This PCT application Apr. 16, 1999, Appl. No. 673,335.

Int. Cl. C07D *301/02;301/12;301/14;301/19*

U.S. Cl. 649—519 **64 Claims**

1. A method for increasing a relative concentration of at least one stereoisomer of a compound having at least one olefinic moiety, from a stereoisomer mixture of said compound, said method comprising contacting an oxidizing agent with a mixture comprising a chiral ketone and said stereoisomer mixture, wherein said method epoxidizes said olefinic moiety of said compound producing an epoxide of at least one stereoisomer of said compound at a relatively higher rate than an epoxide of another stereoisomer of said compound.

US 6,409,770 B1

BLEACHING AND WASHING AGENTS WITH ENZYME BLEACHING SYSTEM

Albrecht Weiss, Langenfeld; Maria Grothus, Friedberg, and Achim Richert, Juelich, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP96/05282, § 371 Date Dec. 11, 1998, § 102(e) Date Dec. 11, 1998, PCT Pub. No. WO97/21796, PCT Pub. Date Jun. 19, 1997

PCT Filed Nov. 29, 1996, Appl. No. 142,244

Claims priority, application Germany, Dec. 8, 1995, 195 45 729

Int. Cl. D06L *3/02;* **C12N** *9/04;* **C11D** *3/386*

U.S. Cl. 8—107 **11 Claims**

1. A bleaching detergent composition comprising:

a) an enzymatic bleaching system that produces hydrogen peroxide under aqueous conditions comprising an enzyme having amino alcohol oxidase activity and a substrate for said enzyme;

b) a bleach activator; and

c) a linear alkyl benzene sulfonate surfactant.

US 6,409,771 B2

PROCESS FOR REMOVAL OF EXCESS DYE FROM PRINTED OR DYED FABRIC OR YARN

Ture Damhus, Copenhagen, Denmark; Uwe Vogt, Monheim, Germany, and Palle Schneider, Lynge, Denmark, assignors to Novozymes A/S, Bagsvaerd, Denmark

Division of application No. 09/500,195, filed on Feb. 8, 2000, now Pat. No. 6,248,134, which is a division of application No. 09/221,653, filed on Dec. 23, 1998, now Pat. No. 6,048,367, Provisional application No. 60/071,184, filed on Jan. 12, 1998. This application May 11, 2001, Appl. No. 853,843.

Claims priority, application Denmark, Dec. 23, 1997, 1526/97

Int. Cl. D06L *3/02;3/11*

U.S. Cl. 8—111 **21 Claims**

1. A process for removal of excess dye from newly manufactured printed or dyed fabric or yarn, comprising treatment with a rinse liquor comprising

(a) at least one enzyme exhibiting peroxidase activity or laccase activity,

(b) an oxidation agent, and

(c) N-hydroxyacetanilide.

US 6,409,772 B2

USE OF HYDROXYSTILBENES FOR DYEING, READY-TO-USE COMPOSITION CONTAINING THEM AND DYEING PROCESS

Francis Pruche, Paris; Didier Saint Leger, Courbevoie, and Bruno Bernard, Neuilly S/Seine, all of France, assignors to L'Oreal, Paris, France

Filed Dec. 21, 1999, Appl. No. 467,896

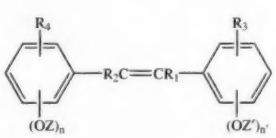
Claims priority, application France, Dec. 22, 1998, 98 16258

Int. Cl. A61K *7/13*

U.S. Cl. 8—406 **19 Claims**

1. Ready-to-use dye composition, characterized in that it comprises, in a medium which is suitable for dyeing, from 0.01 to 10% by weight relative to the total weight of the ready-to-use dye composition, of at least one compound of formula (I):

(I)



in which:

n denotes an integer from 2 to 4,

n' denotes an integer from 0 to 4,

R_1 and R_2, which may be identical or different, denote a hydrogen atom, a halogen atom or an alkyl, alkoxy, carboxyl or acyl radical;

R_3 and R_4, which may be identical or different, denote a hydrogen atom, a halogen atom or an alkyl, alkoxy, carboxyl or acyl radical;

Z and Z', which may be identical or different, denote a hydrogen atom or a glycosyl radical; and at least one oxidizing agent chosen from hydrogen peroxide, urea peroxide, persalts and peracids, copper salts, quinones and nitrites, pyranose oxidases, glucose oxidases, glycerol oxidases, lactate oxidases, pyruvate oxidases, uricases, choline oxidases, laccases, sarcosine oxidases, bilirubin oxidases, tyrosinases, peroxidases and catalases, or from plant or animal extracts containing the above-mentioned enzymes, optionally in the presence of a donor required for the functioning of the said enzymes.

US 6,409,773 B1

COUPLER FOR USE IN OXIDATIVE HAIR DYEING

Mu-Ill Lim, Trumbull; Yuh-Guo Pan, Stamford, both of Conn., and Margaret Popp, Yonkers, N.Y., assignors to Clairol Incorporated, Stamford, Conn.

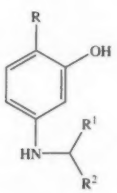
Filed Dec. 14, 2000, Appl. No. 736,913

Int. Cl. A61K *7/13;* **C07C** *209/28;211/44*

U.S. Cl. 8—406 **16 Claims**

1. A compound of the formula (1):

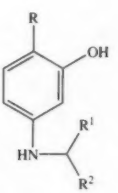
(1)



wherein R is selected from the group consisting of C_1 to C_2 alkyl and hydroxyethyl; R^1 and R^2 are each independently selected from the group consisting of C_1 to C_5 alkyl, C_3 to C_6 cycloalkyl, C_1 to C_5 alkoxy, C_1 to C_5 hydroxyalkyl, and C_1 to C_5 hydroxyalkoxy, or R^1 and R^2 together with the carbon atom to which they are attached form a C_3 to C_6 cycloalkyl group.

9. In a hair coloring system comprising a composition containing one or more oxidative hair coloring agents and a composition containing one or more oxidizing agents, the improvement comprising the presence in the composition containing one or more oxidative hair coloring agents of a coupler comprising a compound of the formula (1):

(1)



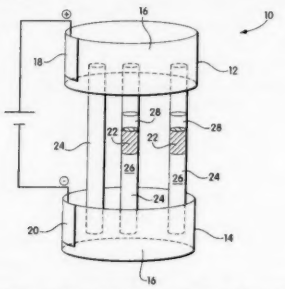
wherein R is selected from the group consisting of C_1 to C_2 alkyl and hydroxyethyl, R^1 and R^2 are each independently selected from the group consisting of C_1 to C_5 alkyl, C_3 to C_6 cycloalkyl, C_1 to C_5 alkoxy, C_1 to C_5 hydroxyalkyl, C_1 to C_5 hydroxyalkoxy, or R^1 and R^2 together with the carbon atom to which they are attached form a C_3 to C_6 cycloalkyl group.

US 6,409,774 B1

ELECTROPHORESIS-ASSISTED STAINING OF MATERIALS

Russell L. Kerschmann, Mill Valley; Ronald Odom, San Francisco; Thomas Kuwahara, San Francisco, and Mark Reddington, San Francisco, all of Calif., assignors to Resolution Sciences Corporation, Corte Madera, Calif.

Filed Jun. 11, 1999, Appl. No. 330,400
Int. Cl. G01N *27/26;27/447;* **D06P** *5/20*
U.S. Cl. 8—444 **20 Claims**



1. A method for en bloc staining a sample, said method comprising the steps of:

a) immersing the sample in a staining solution including (i) an ionically conductive solution, and (ii) a charged stain molecule and/or stain precursor that associates with a component of the sample;

b) applying an electric field across the staining solution, whereby the stain molecule penetrates into the sample to produce an en bloc stained sample; and

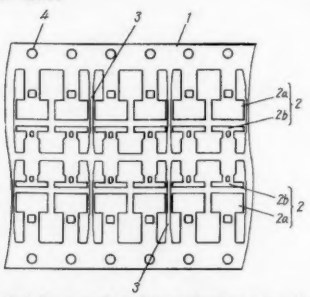
c) embedding said en bloc stained sample.

US 6,409,775 B1

METHOD OF MOLDING A PLURALITY OF SOLID ELECTROLYTIC CAPACITORS ON A METAL LEAD FRAME

Masatoshi Tasei, and Kenji Kuranuki, both of Kyoto, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 9, 2000, Appl. No. 500,898
Claims priority, application Japan, Feb. 9, 1999, 11-030950
Int. Cl. H01L *21/64;* **H01G** *9/00;4/228;* **B29C** *13/00;* **B29B** *7/00*
U.S. Cl. 29—25.03 **8 Claims**



1. A method for manufacturing a plurality of solid electrolytic capacitors, said method comprising the steps of:

providing a metal lead frame having a plurality of terminal sections disposed at a regular interval along the length of the metal lead frame with spaces there between, the spaces alternately comprising a cross piece extending across the width of the metal lead frame and an opening so that there is one cross piece for every two terminal sections;

mounting an electrolytic capacitor element on each terminal section;

locating a molding die over the metal lead frame so that a main runner of the molding die extends along the length of at least one side of the metal lead frame and sub-runners of the molding die extending from the main runner are positioned within the spaces comprising an opening; and

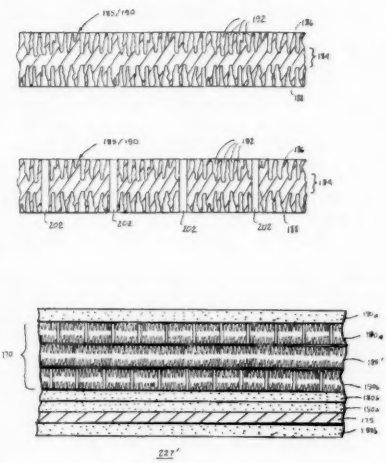
injecting a molding resin onto the electrolytic capacitor elements through the main runner and sub-runners to encapsulate the electrolytic capacitor elements.

US 6,409,776 B1

IMPLANTABLE MEDICAL DEVICE HAVING FLAT ELECTROLYTIC CAPACITOR FORMED WITH NONTHROUGH-ETCHED AND THROUGH-HOLE PUNCTURED ANODE SHEETS

Jenn-Feng Yan, Maple Grove; Darrel F. Untereker, Oak Grove, both of Minn., and Ann M. Crespi, Mobile, Ala., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 30, 2000, Appl. No. 608,576
Int. Cl. H01G *9/00*
U.S. Cl. 29—25.03 **3 Claims**



1. A process for making an anode layer for use in an electrolytic capacitor comprising the steps of

(a) providing a thin metallic anode foil;

(b) etching said thin metallic anode foil to form pores extending part way through the thin metallic anode foil thereby forming an etched anode foil providing enhanced surface area

(c) cutting the etched anode foil to provide first, second and third etched anode sheets each having first and second opposed major surfaces bounded by an anode sheet edge and an anode sheet thickness;

(d) forming a plurality of through-holes extending between said first and second opposed major surfaces and through said anode sheet thickness of said first and second etched anode sheets;

(e) forming an oxide layer overlying the pore and through-hole surfaces of said first and second etched anode sheet and the pore surfaces of the third etched anode sheet; and

(f) assembling said first, second and third etched anode sheets into an anode layer having the third etched anode sheet assembled between the first and second etched anode sheets.

US 6,409,777 B2
SOLID ELECTROLYTIC CAPACITOR AND METHOD OF MANUFACTURING THE SAME

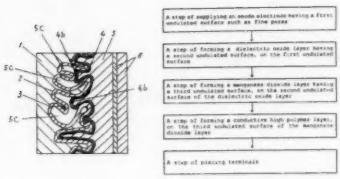
Yasuhiro Kobatake, Osaka; Yukihiro Nitta, Kyoto, and Kazuyo Saito, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of application No. 09/505,602, filed on Feb. 16, 2000, now Pat. No. 6,324,050. This application Dec. 29, 2000, Appl. No. 751,130.

Claims priority, application Japan, Feb. 16, 1999, 11-036686

Int. Cl. H01G *9/00;9/04;9/042*

U.S. Cl. 29—25.03 **20 Claims**


A step of supplying an anode electrode having a first undulated surface such as fine pores
A step of forming a dielectric oxide layer having a second undulated surface, on the first undulated surface
A step of forming a manganese dioxide layer having a third undulated surface, on the second undulated surface of the dielectric oxide layer
A step of forming a conductive high polymer layer, on the third undulated surface of the manganese dioxide layer
A step of placing terminals

1. A manufacturing method of solid electrolytic capacitor comprising the steps of:

(a) supplying an anode electrode having a first undulated surface, wherein said anode electrode having said first undulated surface comprises a roughened metal foil,

(b) forming a dielectric oxide layer on said first undulated surface, said dielectric oxide layer having a second undulated surface coinciding with said firse undulated surface,

(c) forming a manganese dioxide layer on said second undulated surface, said manganese dioxide layer having a third undulated surface continuously coinciding with said second undulated surface,

wherein said step of forming said manganese dioxide layer comprises the steps of

(i) immersing said anode electrode comprising said dielectric oxide layer in an aqueous solution of manganese nitrate having a concentration in the range of about 6.5 wt % to about 26.5 wt % and adhering manganese nitrite to said electrode comprising said dielectric oxide layer,

(ii) removing said anode electrode comprising said dielectric oxide layer from said aqueous solution of manganese nitrate, and

(iii) pyrolysing said manganese nitrate adhered to said anode electrode comprising said dielectric oxide layer and forming said manganese oxide layer;

wherein said manganese dioxide layer comprises about 5 ng to about 15 ng per 1 mm^2 of the second undulated surface,

(d) forming a conductive polymer layer on said third undulated surface, and

(e) forming a cathode layer above said conductive polymer layer.

US 6,409,778 B1
ADDITIVE FOR BIODIESEL AND BIOFUEL OILS

Clemens Auschra, Freiburg; Joachim Vetter, Offenbach; Uwe Boehmke, and Michael Neusius, both of Darmstadt, all of Germany, assignors to Rohmax Additives GmbH, Darmstadt, Germany

PCT No. PCT/EP98/07410, § 371 Date Jun. 28, 2000, § 102(e) Date Jun. 28, 2000, PCT Pub. No. WO99/27037, PCT Pub. Date Jun. 3, 1999

PCT Filed Nov. 18, 1998, Appl. No. 530,972

Claims priority, application Germany, Nov. 21, 1997, 197 51 501; Oct. 14, 1998, 198 47 423

Int. Cl. C10L *1/18*

U.S. Cl. 44—388 **19 Claims**

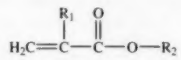
1. A biodiesel composition comprising:

i) a biofuel fatty acid ester of monohydric alcohols as a base fuel; and

ii) 0.005 to 5 wt. % of a copolymer comprising the following monomer components:

a) 48 to 98 wt % of compounds of formula I

(I)



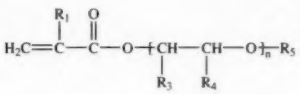
where:

R_1=H or CH_3

R_2 =alkyl with a chain length of 8 to 30, which can also be branched;

b) 2 to 30 wt % of one or more oxygen-containing compounds of formula II

(II)



where:

R_1=the same meanings as in formula I

R_3=H or CH_3

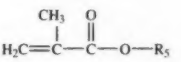
R_4=H or CH_3

R_5=H or an alkyl group with 1 to 20 carbon atoms, which can also be branched, or alkyl group with 1 to 20 carbon atoms substituted by one or more aryl groups

n=a number between 1 and 30 as well as

c) optionally 0 to 30 wt % of a methacrylate of formula III

(III)



where:

R_5=C_1 to C_4 alkyl or styrene, the proportions of a) to c) adding up to 100 wt %.

US 6,409,779 B2
METHOD FOR RENDERING A DETONATION FRONT HARMLESS

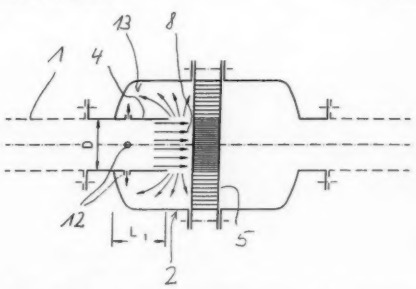
Christoph Leinemann, Braunschweig, Germany, assignor to Leinemann GmbH & Co., Braunschweig, Germany

Division of application No. 09/296,405, filed on Apr. 23, 1999, now Pat. No. 6,342,082. This application Jan. 10, 2001, Appl. No. 756,915.

Claims priority, application Germany, Apr. 25, 1998, 198 18 572

Int. Cl. G05B *9/00;* **F17D** *3/00*

U.S. Cl. 48—192 **7 Claims**



1. A method for rendering harmless a detonation front flowing in a pipeline using a flame-arresting device having a diameter larger than a diameter of the pipeline, the method including the steps of:

providing a pipe stub proximate to the flame-arresting device;

conveying, via the pipe stub, the detonation front to a portion of the flame-arresting device having a diameter substantially equal to the detonation front, the diameter of the detonation front being substantially equal to a diameter of the pipe stub;

permitting the detonation front to impinge on the portion of the flame-arresting device;

permitting the detonation front to expand in front of the flame-arresting device.

US 6,409,780 B1

WATER-LADEN SOLID MATTER OF VAPOR-PHASE PROCESSED INORGANIC OXIDE PARTICLES AND SLURRY FOR POLISHING AND MANUFACTURING METHOD OF SEMICONDUCTOR DEVICES

Hiroyuki Yano, Yokohama; Nobuo Hayasaka, Yokosuka; Katsuya Okumura, Yokohama; Akira Iio, Yokkaichi; Masayuki Hattori, Ama-gun, and Kiyonobu Kubota, Yokkaichi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, and JSR Corporation, Tokyo, both of Japan

Filed Jan. 14, 2000, Appl. No. 482,937

Claims priority, application Japan, Jan. 18, 1999, 11-009885

Int. Cl. C09K *3/14;* **C09G** *1/02;* **C01B** *6/00*

U.S. Cl. 51—307 **5 Claims**

1. Grains of water-laden solid matter produced by a method consisting essentially of adding 40 to 300 weight parts of water to 100 weight parts of inorganic oxide powder, the grains having an average size within a range of 0.5 to 100 mm in diameter, wherein said inorganic oxide powder is synthesized by either fumed process or Nano-phase Technology's process.

US 6,409,781 B1

POLISHING SLURRIES FOR COPPER AND ASSOCIATED MATERIALS

William A. Wojtczak, Santa Clara, Calif.; Thomas H. Baum, New Fairfield, Conn.; Long Nguyen, and Cary Regulski, both of San Jose, Calif., assignors to Advanced Technology Materials, Inc., Danbury, Conn.

Filed May 1, 2000, Appl. No. 562,298

Int. Cl. C09K *3/14;* **C09G** *1/02;1/04*

U.S. Cl. 51—308 **42 Claims**

1. A chemical mechanical polishing slurry comprising:

a first slurry, wherein said first slurry has a removal rate on copper of greater than 5000 Å/min and a removal rate on barrier material of less than 500 Å/min; and

a second slurry having a pH in a range of from about 2–5, wherein said second slurry has a removal rate on said barrier material of greater than 1000 Å/min and a removal rate on copper of less than 1000 Å/min and a dielectric material removal <500 Å/min.

US 6,409,782 B2

POWDER COMPOSITION AND METHOD FOR POLISHING STONE

Wing Thye Lum, 26 Bayshore Road, #21-02, Singapore 469972, Singapore, and Whee Huat Tan, Singapore 650404, Singapore, assignors to Wing Thye Lum, Singapore, Singapore

Filed Dec. 4, 2000, Appl. No. 729,887

Int. Cl. C09K *3/14;* **C09G** *1/02;1/04*

U.S. Cl. 51—309 **11 Claims**

1. A stone polishing composition powder comprising:

10 to 40% by weight of stannic oxide particles having an average particle size (D50 micron) of 1 to 10 μm; and

60 to 90% by weight of a stainless steel powder having an apparent density of 4.5 to 5.0 Kg/dm^3 and a particle size of less than 0.5 mm.

US 6,409,783 B1

AIR CLEANER SYSTEM FOR MOTORCYCLE

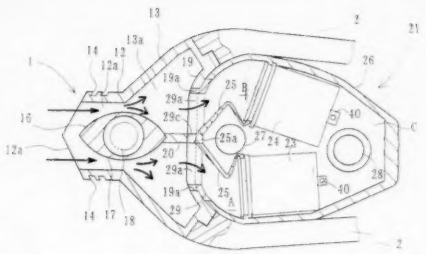
Yoshikazu Miyajima, and Naohisa Hirao, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 2000, Appl. No. 656,994

Claims priority, application Japan, Sep. 7, 1999, 11-292757; Feb. 9, 2000, 2000-031685

Int. Cl. B62D *61/02*

U.S. Cl. 55—385.3 **20 Claims**



1. An air cleaner for a motorcycle having a longitudinal center line in which the air cleaner is disposed between a fuel tank supported over a body frame and an engine supported under the body frame, comprising:

a common case main body for holding the air cleaner, said common case main body being positioned beneath the fuel tank and on the longitudinal center line of the motorcycle; and

a plurality of independent air cleaner elements disposed sideways in the common case main body for said air cleaner.

US 6,409,784 B1

FILTER WITH A PLANAR FILTER INSERT

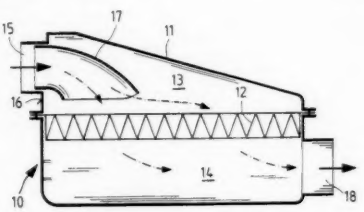
Dieter Wehr, Stuttgart, Germany, assignor to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany

Filed Sep. 8, 2000, Appl. No. 658,262

Claims priority, application Germany, Sep. 10, 1999, 199 43 467

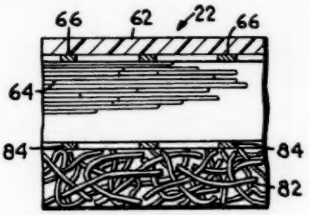
Int. Cl. B01D *35/30*

U.S. Cl. 55—385.3 **9 Claims**



1. A filter comprising a filter housing, a housing cover, and a planar filter insert sealingly installed in said housing such that the filter insert divides the housing into an inlet chamber for fluid to be filtered from an outlet chamber for filtered fluid; at least one inlet for admitting fluid to be filtered into said inlet chamber, and an outlet for discharging filtered fluid from said outlet chamber; said at least one inlet having an inlet opening cross section aligned substantially perpendicular to the plane of said filter insert, wherein said filter is equipped adjacent said at least one inlet with a deflector for deflecting fluid to be filtered entering said inlet chamber in a direction perpendicular to the planar surface of the filter insert and toward the planar surface of said filter insert adjacent said at least one inlet, and wherein said deflector comprises a curved tube which receives fluid from said at least one inlet and discharges the fluid toward the planar filter insert.

US 6,409,785 B1
CLEANABLE HEPA FILTER MEDIA
Alan Smithies, Overland Park; James Roy Doehla, Shawnee Mission, and Anthony Joseph Thill, Overland Park, all of Kans., assignors to BHA Technologies, Inc., Kansas City, Mo.
Filed Aug. 7, 2000, Appl. No. 633,435
Int. Cl. B01D *46/02*
U.S. Cl. 55—486 **18 Claims**



1. A cleanable filter media laminate, said cleanable filter media laminate comprising:

a porous primary filtration layer, said primary filtration layer tending to have less than a HEPA filtration rating upon being damaged, said porous primary filtration layer comprising a microporous expanded polytetrafluoroethyene membrane;

a first substrate layer attached to said primary filtration layer for maintaining shape of said filter media, said first substrate layer comprising a non-woven filtration media and being less than HEPA rated; and

a second substrate layer attached to said first substrate layer to function as a secondary filter in the event of damage to said primary filtration layer, said second substrate layer comprising a non-woven filtration media and being less than HEPA rated; and

said cleanable filter media laminate being pleated and having a HEPA filtration rating.

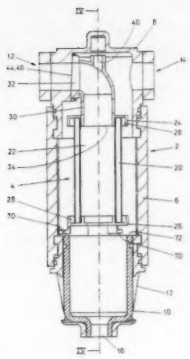
US 6,409,786 B1
FILTER ASSEMBLY
Kenneth Wright, Newcastle-upon-Tyne; Brian Lane, Hebburn; Stephen Nicholas Smith, Chester le Street; Paul David Shaw, Sunderland, and Alan Bateman, South Hylton, all of United Kingdom, assignors to Domnick Hunter Limited, Birtley, United Kingdom
PCT No. PCT/GB98/03675, § 371 Date Aug. 28, 2000, § 102(e) Date Aug. 28, 2000, PCT Pub. No. WO99/30801, PCT Pub. Date Jun. 24, 1999
PCT Filed Dec. 14, 1998, Appl. No. 581,325
Claims priority, application United Kingdom, Dec. 15, 1997, 9726418; Jul. 23, 1998, 9815955
Int. Cl. B01D *46/24*
U.S. Cl. 55—507 **31 Claims**

1. A filter assembly for collecting material that is entrained in a gas stream, which comprises:

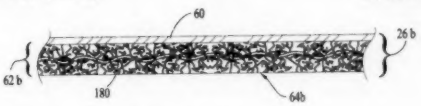
(a) a housing having inlet and outlet ports for the gas that is to be filtered, which comprises an end cap in which at least one of the said ports is provided, and a body section in which a tubular filter element can be located arranged for the gas stream to flow through its wall provided by a filter medium, the end cap and the body section being separable to allow access to the inside of the housing, and

(b) a tubular member which can be sealingly connected to the end cap in fluid communication with one of the ports therein, the tubular member bearing a resiliently deformable tang,

the housing having a recess formed thereon in which the tang can be received when the tubular member and the housing end cap are properly assembled, the reception of the tang in the recess involving resilient deformation of the tang during formation of a connection between the tubular member and the housing, the recess allowing the configuration of the tang to be restored at least partially towards the undeformed configuration.



US 6,409,787 B1
BICOMPONENT SUBSTRATE FOR FILTER ELEMENT WITH MEMBRANE
Alan Smithies, Evan, Ga., and Vikas Madhusudan Nadkarni, Pune, India, assignors to BHA Technologies, Inc., Kansas City, Mo.
Continuation-in-part of application No. 09/277,516, filed on Mar. 26, 1999, now Pat. No. 6,110,249. This application Jun. 22, 2000, Appl. No. 599,706.
Int. Cl. B01D *29/13*
U.S. Cl. 55—514 **20 Claims**



1. A filter element comprising:

a substrate constructed from at least two different materials, a first one of said materials having a first temperature at which said first material activates and a second one of said materials being at least partially crystalline and having a second temperature which is lower than the first temperature at which said second material activates;

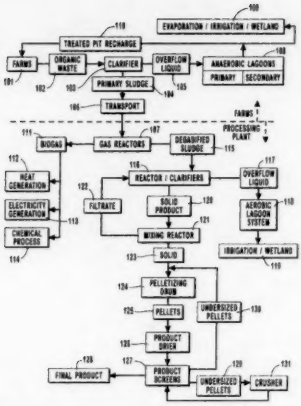
a porous membrane supported by said substrate; and

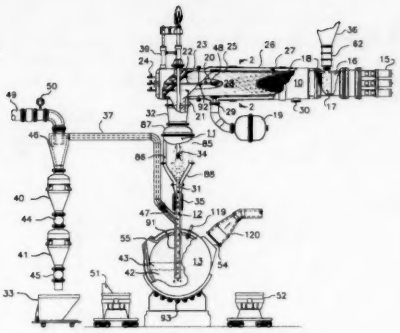
an attachment between said substrate and said membrane, said attachment resulting from said second material of said substrate activated at a temperature less than the first temperature to engage portions of said membrane at spaced apart locations and fix together said membrane and said substrate upon said second material then cooling to a temperature less than the second temperature.

US 6,409,788 B1
METHODS FOR PRODUCING FERTILIZERS AND FEED SUPPLEMENTS FROM AGRICULTURAL AND INDUSTRIAL WASTES
Larry P. Sower, Milford, Utah, assignor to Crystal Peak Farms, Milford, Utah
Provisional application No. 60/072,372, filed on Jan. 23, 1998. This application Jan. 22, 1999, Appl. No. 235,461.
Int. Cl. C01F *1/00;3/00;5/00;7/00;9/00*
U.S. Cl. 71—11 **34 Claims**

1. A method for treating organic waste, comprising the steps of:

(a) obtaining organic waste, said organic waste having unseparated settleable and nonsettleable material, wherein said





unseparated settleable and nonsettleable material is present in said organic waste in excess of what said material would be present in a supernatant solution obtained from a primary treatment of waste;

(b) introducing the organic waste having unseparated settleable and nonsettleable material into a reactor clarifier to precipitate settleable and nonsettleable material from said organic waste by mixing said organic waste having unseparated settleable and nonsettleable material with substances that include a flocculant, a phosphate precipitating agent, a base, and optionally an ammonia retaining agent, thus producing a precipitate and a liquid;

(c) separating said precipitate from said liquid; and

(d) drying said precipitate.

US 6,409,789 B1

ORGANIC BIOSOLID WASTE TREATMENT PROCESS FOR RESOURCE TRANSFORMATION, REGENERATION, AND UTILIZATION

R. Gene Gilbert, 7338 S. Yukon Ct., Littleton, Colo. 80128

Filed Feb. 7, 2000, Appl. No. 499,544

Int. Cl. C05F *3/00*

U.S. Cl. 71—15 **19 Claims**

1. A resource regeneration process for creating an organic biomeal nutrient-rich product from poultry litter, the process comprising:

initially mixing conditioning the poultry litter to a substantially uniform size;

oxidizing the poultry litter;

secondarily mixing the oxidized and transformed poultry litter; and

drying the oxidized and regenerated poultry litter thereby completing the resource regeneration process for creating an organic biomeal nutrient-rich product from poultry litter.

US 6,409,790 B1

METHOD AND APPARATUS FOR PRACTICING CARBONACEOUS-BASED METALLURGY

Albert Calderon, and Terry James Laubis, both of Bowling Green, Ohio, assignors to Calderon Energy Company of Bowling Green, Inc., Bowling Green, Ohio

Filed Mar. 16, 2001, Appl. No. 808,963

This patent is subject to a terminal disclaimer.

Int. Cl. C21B *13/14*

U.S. Cl. 75—10.12 **56 Claims**

1. A method for thermally processing a metallic oxide with a carbonaceous material in one or more chambers, wherein each of the one or more chambers has a charging end and a discharging end, to produce a hot metallized/carbon product which is subsequently melted in a melter to make a molten metal and a molten slag, comprising:

feeding the metallic oxide and the carbonaceous material to the charging end of said one or more chambers and forcing the metallic oxide and the carbonaceous material toward the discharging end of said one or more chambers;

injecting an oxidant in such a way as to utilize at least a portion of the energy contained in said carbonaceous material to release thermal energy and produce pressurized reducing gases to reduce the metallic oxide to form a hot metallized/carbon product;

discharging said hot metallized/carbon product from said one or more chambers into the melter;

heating the metallized/carbon product in the melter to produce a hot pressurized off-gas, a molten metal and a molten slag; and

segregating the off-gas, the molten slag and the molten metal.

US 6,409,791 B1

METALLOTHERMAL PROCESS AND CONTINUOUS DRAWING, IN COLD INDUCTION FURNACES, OF METALS OR ALLOYS

Jany Petit, Serignan du Comtat; Laurent Philippe, Voglans, and Véronique Hurbin, Saint Paul Châteaux, all of France, assignors to Compagnie Generale des Matieres Nucleaires, Velizy Villacoublay, France

PCT No. PCT/FR98/01630, § 371 Date Apr. 10, 2000, § 102(e) Date Apr. 10, 2000, PCT Pub. No. WO99/05330, PCT Pub. Date Feb. 4, 1999

PCT Filed Jul. 23, 1998, Appl. No. 463,255

Claims priority, application France, Jul. 25, 1997, 97 09500

Int. Cl. C22B *9/18;9/187*

U.S. Cl. 75—10.14 **15 Claims**

1. A metallothermy method for continuously forming an ingot of a metal from a metal salt or a metal oxide of said metal comprising the steps of:

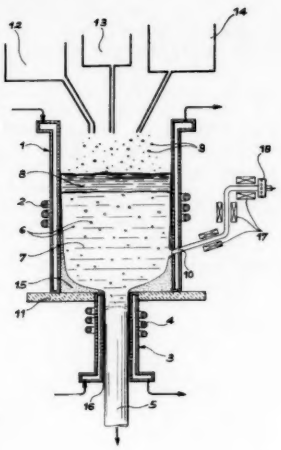
a) providing a first cold crucible heated by induction and a second cold crucible heated by induction, said second crucible being in fluid communication with and located under said first cold crucible to continuously form said ingot,

b) forming a layer of a melting material composed of a reducing medium floating on a solvent medium composed of at least one molten salt in said first cold crucible,

c) introducing said metal salt or metal oxide into said layer,

d) reducing said metal salt or metal oxide entirely in said layer and forming particles of slag and of said metal,

e) settling said metal particles downwardly through said solvent medium in said first cold crucible to pass said metal particles into said second cold crucible and solubilizing said slag in said solvent medium,



f) collecting and melting said metal particles in said second cold crucible to form said ingot,

g) continuously drawing off said ingot from said second cold crucible.

US 6,409,792 B1

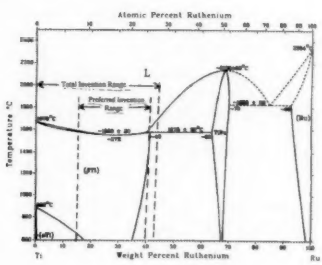
PROCESS FOR MELTING AND CASTING RUTHENIUM-CONTAINING OR IRIDIUM-CONTAINING TITANIUM ALLOYS

Ronald W. Schutz, Canfield; Kuang-O Yu, Highland Heights; Richard L. Porter, Boardman, and Frank P. Spadafora, West Niles, all of Ohio, assignors to RMI Titanium Company, Niles, Ohio

Filed Nov. 6, 2000, Appl. No. 707,829

Int. Cl. C22B *34/12;* **C22C** *1/03;14/00*

U.S. Cl. 75—10.18 **38 Claims**



1. A process for manufacturing an alloy comprising titanium and a second metal selected from the group consisting of ruthenium and iridium, said process comprising the steps of:

(a) producing a master alloy comprising titanium and said second metal, wherein said master alloy, titanium and said second metal each have a melting point, and said master alloy melting point is about equal to or lower than said titanium melting point, and said master alloy melting point is lower than said second metal melting point; and

(b) reducing said master alloy produced in step (a) in size and then blending said reduced master alloy with a source of titanium.

US 6,409,793 B1

METHOD FOR PROCESSING STEEL SLAGS CONTAINING CHROMIUM

Alfred Edlinger, Baden, Switzerland, assignor to "Holderbank" Financiere Glarus AG, Glarus, Switzerland

PCT No. PCT/AT00/00088, § 371 Date Dec. 22, 2000, § 102(e) Date Dec. 22, 2000, PCT Pub. No. WO00/65108, PCT Pub. Date Nov. 2, 2000

PCT Filed Apr. 14, 2000, Appl. No. 720,420

Claims priority, application Austria, Apr. 22, 1999, 719/99

Int. Cl. C22B *7/04;34/32*

U.S. Cl. 75—10.35 **18 Claims**

1. A method for processing a molten bath of steel slags containing chromium, characterized in that the molten steel slags containing chromium are supplemented with chromium ores or chromium-containing and/or nickel-containing dusts in order to produce a mixed slag having a slag basicity of 1.2 to 1.6, maintaining temperature of the bath above 1600° C., introducing the mixed slag into a carbon-containing iron bath to form a mix containing a ferrochromium alloy, and separately tapping the ferrochromium alloy from the mix.

US 6,409,794 B2

METHOD FOR PRODUCING COMPOSITE POWDERS BASED ON SILVER-TIN OXIDE, THE COMPOSITE POWDERS SO PRODUCED, AND THE USE OF SUCH POWDERS TO PRODUCE ELECTRICAL CONTACT MATERIALS BY POWDER METALLURGY TECHNIQUES

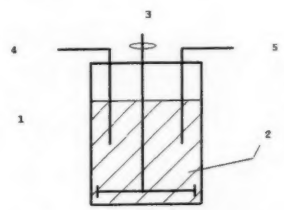
Roger Wolmer, Gelnhausen; Mechthild Mueller, Hasselroth; Frank Heringhaus, Alzenau; Dietrich Ruehlicke, Freiberg/Sachsen, all of Germany, and Dan Goia, Branchburg, N.J., assignors to DMC² Degussa Metals Catalysts Cerdec AG, Frankdurt am Main, Germany

Filed Apr. 4, 2001, Appl. No. 825,363

Claims priority, application Germany, Apr. 6, 2000, 100 17 282

Int. Cl. B22F *3/12;3/24;9/18*

U.S. Cl. 75—232 **16 Claims**



1. A method for producing a composite powder, comprising simultaneously adding to an aqueous suspension of particulate tin oxide, separately and continuously with intensive mixing, stoichiometrically equivalent amounts of: i) a solution of a silver compound, and ii) a solution of a reducing agent.

US 6,409,795 B2

COATING METHODS, COATING PRODUCTS AND COATED ARTICLES

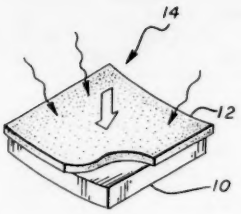
George K. Sievers, and Eugene V. Clark, both of Burbank, Calif., assignors to General Electric Company, Schenectady, N.Y.

Division of application No. 08/661,494, filed on Jun. 11, 1996, now Pat. No. 5,883,314, Provisional application No. 60/015,251, filed on Apr. 10, 1996. This application Nov. 17, 1998, Appl. No. 195,117.

Int. Cl. B22F *1/00;1/02*

U.S. Cl. 75—255 **10 Claims**

1. A mixture of two powdered alloys each comprising a base of



elements M, Cr and Al in which M is at least one element selected from the group consisting of Ni, Co and Fe, the mixture having a total mixture composition comprising by weight, 10–35% Cr, 4–10% Al, from a small but effective amount up to about 0.09% Y, 2–6% Si, with the balance M, said Si being present solely as a diffused element into the lower temperature range melting one of said powdered alloys.

US 6,409,796 B1

METHOD FOR PRODUCTION OF TANTALUM AND NIOBIUM POWDERS WITH HIGHLY DEVELOPED SURFACE

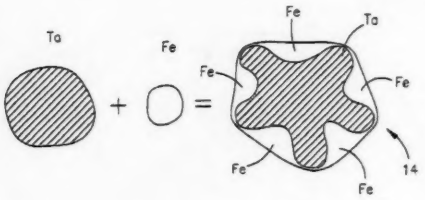
Dina Surpin, Rehovot, Israel, assignor to Advanced Alloy Technologies, Ltd., Migdal Haemek, Israel

Filed Oct. 6, 2000, Appl. No. 684,172

Claims priority, application Israel, Oct. 8, 1999, 132291

Int. Cl. B22F *3/10;* **C22C** *1/08;1/04*

U.S. Cl. 75—255 **27 Claims**



1. A method of treatment of an initial powder of a metal selected from a group consisting of tantalum, niobium and mixtures thereof for developing the surface of the initial selected metal powder particles, the method comprising the steps of:

(a) mechanically alloying the initial selected metal powder with a powder of an auxiliary substance having relatively weak corrosion resistance as compared to that of the selected metal, thereby providing interaction between the particles of the selected metal and the auxiliary substance powders, wherein the mechanical alloying is continued until a solid solution of the selected metal and the substance is obtained, in which the metal particle has a substantially developed surface area and is at least partly wetted with said substance substantially within a surface region of the metal particle; and

(b) removing the substance from the obtained solid solution, thereby leaving the selected metal particles with the substantially developed surface area free from the substance.

US 6,409,797 B2

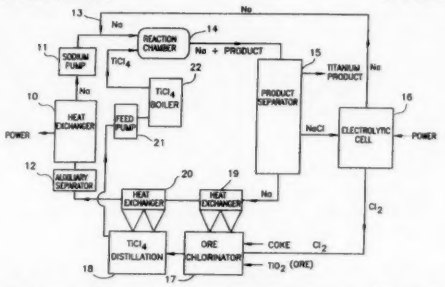
METHOD OF MAKING METALS AND OTHER ELEMENTS FROM THE HALIDE VAPOR OF THE METAL

Donn Reynolds Armstrong, Lisle; Stanley S. Borys, Naperville, and Richard Paul Anderson, Clarendon Hills, all of Ill., assignors to International Titanium Powder LLC, and Krofft Brakston International, Inc., both of Lockport, Ill.

Continuation-in-part of application No. 08/782,816, filed on Jan. 13, 1997, now Pat. No. 5,958,106, which is a continuation-in-part of application No. 08/691,423, filed on Aug. 2, 1996, now Pat. No. 5,779,761, which is a continuation of application No. 08/283,358, filed on Aug. 1, 1994, now abandoned. This application Mar. 8, 1999, Appl. No. 264,577. This patent is subject to a terminal disclaimer.

Int. Cl. C22B *34/12*

U.S. Cl. 75—343 **21 Claims**



1. A method of producing an elemental material of Ti, Al, Sn, Sb, Be, B, Ga, Mo, Nb, Ta, Zr, V, Ir, Os, Re, U or an alloy thereof from a halide vapor of the elemental material or mixtures thereof comprising introducing the halide vapor or mixtures thereof into a continuum of a liquid alkali metal or a liquid alkaline earth metal or mixtures thereof to convert the halide vapor to elemental material or an alloy, said liquid alkali metal or liquid alkaline earth metal or mixtures thereof being present in an amount in excess of the stoichiometric amount needed to reduce the halide to cool the elemental material or alloy to temperatures below the sintering temperature thereof.

US 6,409,798 B1

PROCESS FOR RECOVERING METAL MATERIAL FROM WASTE MATERIAL

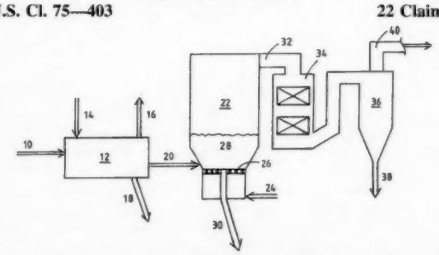
Jorma Nieminen; Juha Palonen; Markku Itäpelto, all of Varkaus; Pekka Harkki, Helsinki, and Lauri Mäkipaja, Varkaus, all of Finland, assignors to Foster Wheeler Energia Oy, Helsinki, Finland

PCT No. PCT/FI99/00667, § 371 Date Mar. 13, 2001, § 102(e) Date Mar. 13, 2001, PCT Pub. No. WO00/09770, PCT Pub. Date Feb. 24, 2000

PCT Filed Aug. 12, 1999, Appl. No. 762,718

Int. Cl. C22B *21/00*

U.S. Cl. 75—403 **22 Claims**



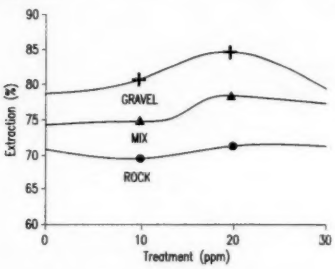
1. A process for recovering metal material from waste material that includes organic material and metal material in the form of thin foil metal material, the process including the following steps:

introducing the waste material into a fluidized bed gasifier;
introducing air through a bottom grid into the gasifier for fluidizing a bed of solid particles in the gasifier, for gasification of the organic material therein and production of a combustible gas;
discharging separately from the gasifier bottom ash and combustible gas produced in the gasification step;
maintaining the temperature in the gasifier below the melting temperature of the metal material;
tearing the thin foil metal material into small metal flakes in the fluidized bed;
setting the velocity of the air in the fluidized bed such that the metal flakes are entrained with the produced combustible gas, but the not-gasified waste material and the bed particles stay in the bed;
discharging the metal flakes from the gasifier together with the combustible gas; and
introducing the combustible gas discharged from the gasifier into a separator, for separating metal material from the combustible gas.

US 6,409,799 B1
COPPER LEACH PROCESS AIDS

Ricardo Arancibia Cifuentes, Santiago, Chile; Donald C. Roe, Jamison, Pa.; Jorge Vergara Chavez, and Andres Reghezza Inzunza, both of Chuquicamata, Chile, assignors to Betzdearborn Inc. & Corporacion Nacional del Cobre de Chile, Trevose, Pa., a part interest

Provisional application No. 60/109,128, filed on Nov. 19, 1998. This application Nov. 19, 1999, Appl. No. 443,593.
Int. Cl. B01D *11/00;* **B01F** *1/00;* **C21B** *15/00;* **C22B** *15/00*
U.S. Cl. 75—743 **15 Claims**



1. In a method of recovering copper from crushed copper bearing ore wherein an aqueous sulfuric acid leach solution is employed to leach copper from copper bearing ore wherein the improvement comprises adding an antifoam formulation which exhibits antifoam properties at a solution pH of about pH 1 to 2 selected from the group consisting of fatty amides, glycol esters, fatty esters, polyglycols, silicas, silicons, wax dispersions, fatty acids, fatty alcohols, ethoxylated alkyl phenols, ethylene oxide/propylene oxide block copolymers, and mixtures thereof in an amount of from about 5 to about 100 parts per million to said aqueous sulfuric acid leach solution.

US 6,409,800 B1
TEMPERATURE SWING ADSORPTION PROCESS

Adeola F. Ojo, Scotch Plains; Frank R. Fitch, Bedminster, and Martin Bülow, Basking Ridge, all of N.J., assignors to The BOC Group, Inc., Murray Hill, N.J.

Filed Aug. 28, 2000, Appl. No. 648,982
Int. Cl. B01D *53/04*
U.S. Cl. 95—96 **52 Claims**

1. A method of purifying a gas comprising the step of removing at least one nitrogen oxide and at least one low molecular weight hydrocarbon from said gas by subjecting said gas to a cyclical adsorption procedure comprising an adsorption step and an adsorbent regeneration step using a composite zeolitic adsorbent which comprises about 5 to about 95% by weight zeolite A and about 95 to about 5% by weight zeolite X, and wherein at least part of the exchangeable cations of said zeolite A and at least part of the exchangeable cations of said zeolite X are divalent cations.

US 6,409,801 B1
ACTIVATION PROCESSES FOR MONOLITH ADSORBENTS

Dongmin Shen, Berkeley Heights; Sudhakar R. Jale, Scotch Plains; Frank R. Fitch, Bedminster; Ravi Jain, Bridgewater; Arthur I. Shirley, Piscataway; Yaping Lu, Scotch Plains, and Divyanshu R. Acharya, Bridgewater, all of N.J., assignors to The BOC Group, Inc., Murray Hill, N.J.

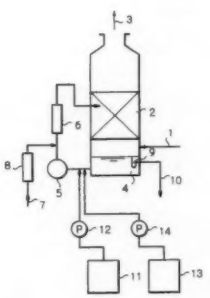
Filed Sep. 29, 2000, Appl. No. 676,012
Int. Cl. B01D *53/02*
U.S. Cl. 95—130 **50 Claims**

1. A process for removing binding agents from a monolith structure while activating the adsorbent in said monolith structure, comprising passing a regeneration gas through said monolith at a temperature which will decompose the binding agents in said monolith.

US 6,409,802 B1
METHOD FOR PREVENTING SCALING IN WET-PROCESS WASTE GAS TREATMENT EQUIPMENT

Takashi Kyotani, Yokohama, Japan, assignor to Ebara Corporation, Tokyo, Japan

PCT No. PCT/JP98/04997, § 371 Date Mar. 1, 2001, § 102(e) Date Mar. 1, 2001, PCT Pub. No. WO99/24151, PCT Pub. Date May 20, 1999
PCT Filed Nov. 6, 1998, Appl. No. 463,662
Claims priority, application Japan, Nov. 10, 1997, 9-321975
Int. Cl. B01D *53/14*
U.S. Cl. 95—152 **38 Claims**

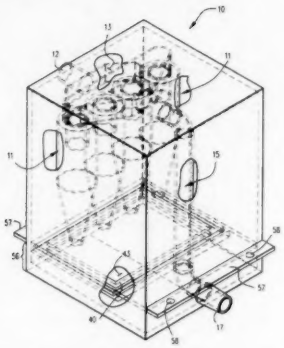


1. A method for purifying an exhaust gas in a wet mode, comprising the steps of:
contacting the exhaust gas with a washing liquid containing water; circulating the washing liquid to reuse it; supplying a constant amount of a feed liquid per unit time to the washing liquid; and
discharging the constant amount of the washing liquid per the unit time from the washing liquid,
the washing liquid containing at least one chelating agent which reacts with ions becoming a cause of scale formation to form a water-soluble chelate compound; and
the exhaust gas having been generated from an apparatus for producing a semiconductor device.

US 6,409,803 B1
AMALGAM SEPARATION

James D. Tremel, Casper, Wyo.; Chenoa J. Jensen, Rapid City, S. Dak.; Garland P. Krabbenhoft, Fort Leonard Wood, Mo.; Daniel F. Dolan, Rapid City, and Robert A. Meyer, Spearfish, both of S. Dak., assignors to RAMVAC Corporation, Spearfish, S. Dak.

Provisional application No. 60/143,644, filed on Jul. 14, 1999. This application Jul. 13, 2000, Appl. No. 616,080.
Int. Cl. B01D *45/12*
U.S. Cl. 95—271 **19 Claims**



1. A method of separating particles from at least one dental operatory effluent line, comprising:

(a) subjecting fluid including gas, liquid, and entrained particles, from a dental operatory to centrifugal separation so that at least the majority of the mass of the particles and liquid are discharged at a first location and the majority of the gas at a second location so that substantially effective separation of the particles from the gas occurs;

(b) filtering the liquid discharged at the first location to collect the majority of the particles therein; and

(c) disposing of the collected particles in an environmentally sound manner,

wherein at least about 95% of the particles in the fluid are separated and disposed.

10. A particle-containing fluid handling system, comprising:

a housing having a particle-containing fluid inlet, and at least one outlet;

a plurality of parallel centrifugal separators mounted in said housing each including a tangential inlet, a bottom outlet, and a top outlet;

a common discharge conduit connected to said top outlets and said at least one housing outlet;

said housing fluid inlet connected to said separator tangential inlets; and

a particle filter mounted in said housing entirely below said separator outlets.

US 6,409,804 B1
SEPARATOR TANK ASSEMBLY FOR A FLUID COMPRESSOR

Roger Cook, Cheshire, and N. Philip Lowe, Lancashire, both of United Kingdom, assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

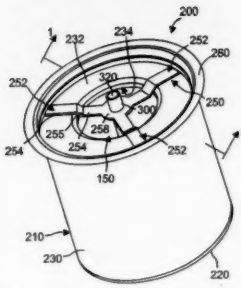
Filed Sep. 29, 2000, Appl. No. 672,003
Int. Cl. B01D *46/00;45/18*
U.S. Cl. 95—273 **26 Claims**

1. A separator element for placement in a separator tank of a fluid compression system, said separator element comprising:

a housing having a base and a sidewall structure;

a support element mounted to the housing; and

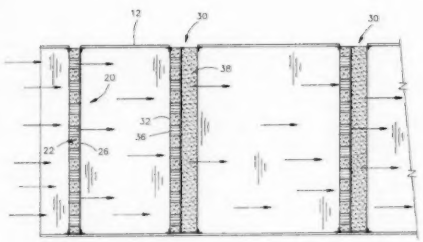
a scavenge tube fixed to the support element so that a first end of the scavenge tube is located at a predetermined position relative to the base of the housing and a second end of the scavenge tube extends from the housing.



US 6,409,805 B1
FLUID FILTER SYSTEM

Scott B. Beier, and Rex A. Adams, both of Omaha, Nebr., assignors to Products Unlimited, Inc., Omaha, Nebr.

Continuation-in-part of application No. 08/146,901, filed on Oct. 20, 1993, now Pat. No. 6,071,419. This application Jan. 3, 2000, Appl. No. 476,555.
Int. Cl. B01D *46/00;37/00*
U.S. Cl. 95—287 **8 Claims**



1. A method of filtering particulate material from a generally unidirectional fluid stream, comprising the steps of:

removably positioning a plurality of first filters in the fluid stream;

and removably positioning a fluid-permeable second filter in the fluid stream downstream of the first filters;

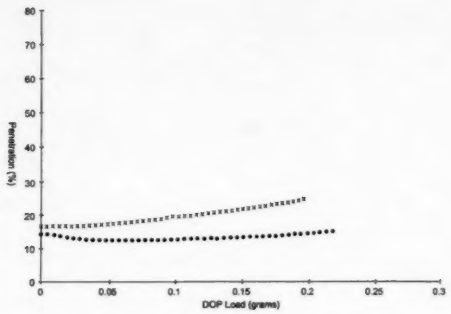
said first filters being a pre-filter and comprising a layer of fluid-permeable material having an intake side and a discharge side, said layer having a plurality of spaced-apart openings extending completely therethrough.

US 6,409,806 B1
FLUORINATED ELECTRET

Marvin E. Jones, Grant Township; Christopher S. Lyons; David B. Redmond, both of St. Paul; Jeffrey L. Solomon, Vadnais Heights, and Seyed Abolhassan Angadjivand, Woodbury, all of Minn., assignors to 3M Innovative Properties Company, St. Paul, Minn.

Continuation of application No. 09/109,497, filed on Jul. 2, 1998. This application Jul. 26, 2000, Appl. No. 625,801.
Int. Cl. B03C *3/28*
U.S. Cl. 96—15 **28 Claims**

1. An electret comprising a nonwoven polymeric article com-



prising at least about 45 atomic % fluorine as detected by ESCA and a CF_3:CF_2 ratio of at least about 0.45 as determined according to the Method of Determining CF_3:CF_2, said article having a Quality Factor of at least about 0.25/mmH_2O.

US 6,409,807 B1

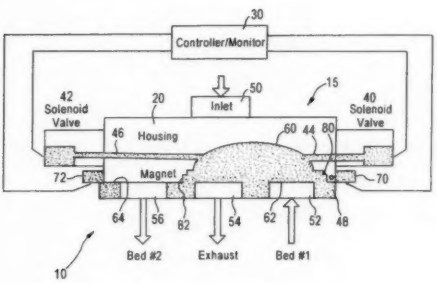
LINEAR GAS VALVE CYCLE CONTROL, SHUT-OFF-VALVE AND SELF TEST

Charles Bradley Hager, Davenport, Iowa, and Kevin Michael Dailey, Rock Island, Ill., assignors to Litton Systems, Inc., Los Angeles, Calif.

Filed May 23, 2000, Appl. No. 576,050

Int. Cl. B01D *53/04*

U.S. Cl. 96—111 **23 Claims**



1. A control system for controlling a gas generating system including at least two molecular sieve beds, comprising:

a linear valve having a housing including an inlet connected to the gas generating system and a first port connected to a first of the at least two molecular sieve beds, a second port for exhaust, and a third port connected to a second of the at least two molecular sieve beds, with said inlet, said first, second and third ports all in communication with a slide chamber having a slide block positioned in said slide chamber;

a push-pull device is mounted to said housing for moving said slide block in a first direction and in a second direction;

a sensor positioned at opposite ends of said slide chamber for sensing the position of said slide block in said slide chamber; and

a controller for receiving information from said sensor and for controlling said push-pull device.

US 6,409,808 B1

SEPARATORS

Neville Paul Chamberlain, Northampton; Ian Charles Bedwell, Leicestershire, both of United Kingdom; Bjorn Christiansen, Tiller, Norway; Gunnar Vangen, Jakosbli, Norway, and Jan Hoydal, Joerpeland, Norway, assignors to Kvaerner Process Systems a.s., Norway

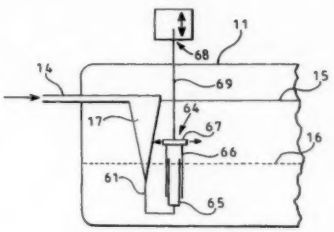
PCT No. PCT/GB98/03453, § 371 Date Jul. 24, 2000, § 102(e) Date Jul. 24, 2000, PCT Pub. No. WO99/25454, PCT Pub. Date May 27, 1999

PCT Filed Nov. 17, 1998, Appl. No. 554,750

Claims priority, application United Kingdom, Nov. 18, 1997, 9724360; Jan. 21, 1998, 9801134; May 9, 1998, 9809906

Int. Cl. B01D *19/00*

U.S. Cl. 96—182 **18 Claims**



1. A gravity separator comprising a vessel within which a mixture containing oil and water can separate under gravity to form vertically discrete oil, water and gas layers, the vessel having an inlet assembly including a cyclone separator for separating oil-containing inlet flow into gas and liquid phases, the gravity separator being characterized by including ducting for receiving the underflow of the cyclone separator and conducting said underflow into that region of the vessel which, in use, is below the gas layer and above the water layer.

US 6,409,809 B1

PIGMENTED COATINGS EXHIBITING REDUCED FADING

Kenneth Breindel, Lansdale, and Samuel A. Firman, Ambler, both of Pa., assignors to Cognis Corporation, Gulph Mills, Pa.

Provisional application No. 60/119,144, filed on Feb. 8, 1999. This application Feb. 8, 2000, Appl. No. 500,336.

Int. Cl. A01N *43/647;37/34;* **C09D** *5/00*

U.S. Cl. 106—18.32 **22 Claims**

1. A coating material containing:

a binder, an amount of a pigment sufficient to provide a coating material having a reflectance of no more than about 25%, and an amount of a biocide effective for increasing the fading resistance of the coating material, the biocide containing a combination of from about 1% to about 99% by weight of a halogenated benzonitrile compound and from about 1% to about 99% by weight of a conazole compound.

US 6,409,810 B1

WATER-SOLUBLE TRISAZO COMPOUNDS, AQUEOUS INK COMPOSITION AND COLORED ARTICLE

Hiroaki Ono; Takashi Miyazawa, both of Tokyo; Toru Tabei, Kitamoto; Yasuo Shirasaki, Omiya; Isao Yamaguchi, Nagareyama, and Kazunobu Nagasaki, Kawaguchi, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP98/01877, § 371 Date Nov. 22, 1999, § 102(e) Date Nov. 22, 1999, PCT Pub. No. WO98/47970, PCT Pub. Date Oct. 29, 1998

PCT Filed Apr. 23, 1998, Appl. No. 403,464

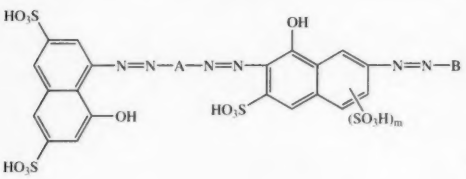
Claims priority, application Japan, Apr. 24, 1997, 9-120121

Int. Cl. C09D *11/02;* **C09B** *31/16*

U.S. Cl. 106—31.13 **9 Claims**

1. A trisazo compound or a salt thereof, wherein said compound is represented by the following general formula (1):

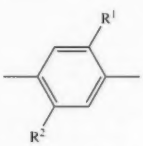
(1)



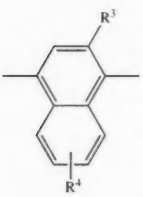
wherein

A is a group of the general formula (2) or (3):

(2)



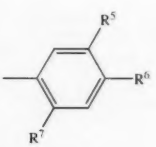
(3)



wherein R^1 and R^2 are each independently amino, sulfo, (C1–C2)alkyl, (C1–C2)alkoxy, or (C2–C4)alkanoylamino, R^3 is hydrogen or (C1–C2)alkoxy, and R^4 is hydrogen or sulfo;

B is a group represented by the general formula (4):

(4)



wherein R^5, R^6 and R^7 are each independently hydrogen, hydroxyl, amino, carboxyl, (C1–C2)alkoxy, (C1–C2)alkylamino optionally substituted with hydroxy, (C2–C3)alkanoylamino or sulfo; and

m is 0 or 1.

US 6,409,811 B1

ANTI-ABRASION INK ADDITIVES CONTAINING REDUCED AMOUNTS OF POLYTETRAFLUOROETHYLENE AND INKS CONTAINING SUCH ADDITIVES

Bruce Tavares, Blairstown, N.J., and James Gambino, Yardley, Pa., assignors to Elementis Specialties, Inc., Hightstown, N.J.

Filed Nov. 6, 2000, Appl. No. 706,401

Int. Cl. C09D *11/00;* **C08L** *91/06*

U.S. Cl. 106—31.29 **19 Claims**

1. An anti-abrasion additive for ink formulations, comprising by weight:

a) from 1 to 30% sintered polytetrafluoroethylene;

b) from 40 to 70% at least one pharmaceutical grade petrolatum; and

c) from 10 to 30% of at least microcrystalline wax having a melting point greater than 190° F.

US 6,409,812 B1

AZO COMPOUNDS AND PROCESS FOR PRODUCING THE SAME

Ryuzo Ueno, Nishinomiya; Masaya Kitayama, Takarazuka; Kenji Minami, Sennan, and Hiroyuki Wakamori, Hyogo-ken, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

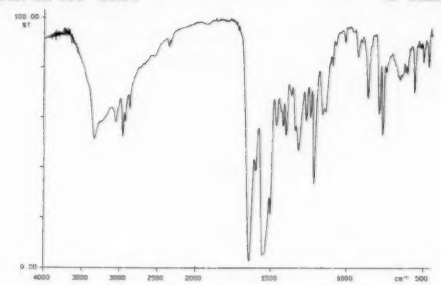
PCT No. PCT/JP99/05656, § 371 Date Jun. 16, 2000, § 102(e) Date Jun. 16, 2000, PCT Pub. No. WO00/23525, PCT Pub. Date Apr. 27, 2000

PCT Filed Oct. 14, 1999, Appl. No. 581,704

Claims priority, application Japan, Oct. 16, 1998, 10/295215; Apr. 13, 1999, 11/105206; Jun. 23, 1999, 11/176626

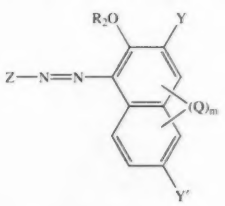
Int. Cl. C09D *11/00;* **C09B** *29/20;* **C07C** *69/76*

U.S. Cl. 106—31.51 **15 Claims**



1. An azo compound having the general formula [I]:

[I]



wherein Y is —(CONH)n-X or an optionally esterified carboxyl group,

Y' is —(CONH)n-X' or an optionally esterified carboxyl group,

(wherein X and X' are optionally substituted and/or branched saturated or unsaturated aliphatic hydrocarbon groups, optionally substituted aromatic groups, or optionally substituted heterocyclic groups having conjugated double bonds,

n is an integer of 1 or 2,

provided that when either Y or Y' is a carboxylic group, said carboxylic group may optionally form an acceptable salt),

R_2 is a hydrogen atom, an optionally branched alkyl group having 1–6 carbon atoms, an acyl group having 1–6 carbon atoms or a phenyl alkyl group,

Q is an optionally branched alkyl group having 1–6 carbon atoms, an optionally branched alkoxy group having 1–6 carbon atoms, a halogen atom, a sulfo group, a nitro group, a nitroso group, or an amino group,

m is an integer of 0–3, provided that when m is 1, the Q may be combined with either of the two condensed rings, when m is 2 or 3, the Qs may be combined with either or both of the condensed rings, or may form a ring together with the two condensed rings, and

Z is an optionally substituted monovalent aromatic group;

provided that at least one of Y and Y' represents a group wherein X or X' is an optionally substituted and/or branched unsaturated or saturated aliphatic hydrocarbon group.

US 6,409,813 B1

GLASS-RELEASE COATING, COATING PROCESS, AND COATED PARTS FOR MANUFACTURING GLASS

Durga P. Beesabathina, 901C Armfield Cir., Apt.#104, Norfolk, Va. 23505, and Karl E. Wiedemann, 104 Rebecca Dr., Seaford, Va. 23696

Provisional application No. 60/134,754, filed on May 18, 1999. This application Nov. 4, 1999, Appl. No. 434,392.

Int. Cl. B32B *7/36*

U.S. Cl. 106—38.22 **29 Claims**

1. A thermally stable, glass-release coating comprising from about 65% to about 95% by weight of an oxide matrix and from about 5% to about 35% by weight of nitride particles after curing; and wherein the oxide matrix is prepared from a solution comprising from about 10% to about 90% by weight of a carrier liquid; from about 0.1% to about 30% by weight of a liquid stabilizer; from about 4.5% to about 40% by weight of an oxide-forming compound; from about 0% to about 4% by weight of an oxide stabilizer; and from about 0% to about 2% by weight of a corrosion inhibitor.

US 6,409,814 B1

PIGMENT PREPARATIONS AND WATER-BORNE EFFECT BASE COATS PREPARED THEREWITH

Werner Bosch; Georg Antonio Cuddemi; Frank Mueller, all of Wuppertal, and Marco Taschner, Sprockhoevel, all of Germany, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 19, 2000, Appl. No. 552,602

Int. Cl. C09C *1/64;1/00*

U.S. Cl. 106—404 **9 Claims**

1. An aqueous pigment preparation having a solids content of 10 to 60 wt-% and comprising:

a) pigments coated with a silicon-oxygen-matrix;

b) at least one carboxyl-functional resin having non-neutralized carboxyl groups sufficient to produce an acid value of 10 to 100 mg KOH/g resin and having a number average molecular mass of 500 to 5000, wherein the weight ratio of pigment to resin is in the range of 1:0.3 to 1:10;

c) at least one water-miscible organic solvent; and

d) water wherein the water content is up to 10% based on the amount of water-miscible solvents.

US 6,409,815 B1

SURFACE-MODIFIED CONDUCTIVE PIGMENT

Alfred Hennemann, Pfungstadt, and Manfred Kieser, Darmstadt, both of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Germany

Filed Apr. 5, 1995, Appl. No. 417,017

Claims priority, application Germany, Apr. 6, 1994, 44 11 807

Int. Cl. C09C *1/62;* **C04B** *14/26;* **B32B** *5/16;* **H01B** *1/00*

U.S. Cl. 106—417 **18 Claims**

1. A surface-modified pigment comprising a conductive pigment of carbon black, carbon fibers, antimony-doped tin oxide, aluminum-doped zinc oxide, fluoride-doped tin oxide or mica, kaolin or barium sulfate coated with a doped metal oxide, wherein the conductive pigment is partially coated by reaction with an organic modifying agent in an amount such that the powder electrical conductance of the surface-modified pigment is 80% or less of the powder electrical conductance of the uncoated conductive pigment but not less than 10^{-7} S.

US 6,409,816 B1

PIGMENT PREPARATIONS BASED ON DIKETOPYRROLOPYRROLE PIGMENTS WITH BASIC PERYLENE DISPERSANTS

Joachim Weber, Frankfurt, and Erwin Dietz, Koenigstein, both of Germany, assignors to Clariant GmbH, Frankfurt, Germany

Filed Feb. 16, 2000, Appl. No. 505,364

Claims priority, application Germany, Feb. 17, 1999, 199 06 494

This patent is subject to a terminal disclaimer.

Int. Cl. C09B *5/62;57/00;67/20;* **C09D** *11/02;* **B01F** *17/32*

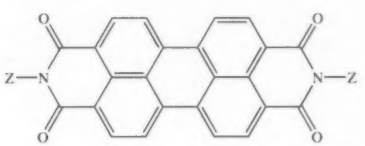
U.S. Cl. 106—494 **16 Claims**

1. A pigment preparation comprising

a) from 40 to 99% by weight of at least one diketopyrrolopyrrole pigment or a mixed crystal containing a diketopyrrolopyrrole pigment, and

b) from 1 to 40% by weight of at least one pigment dispersant of formula (I);

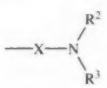
(I)



in which the two radicals Z are identical or different and have the definition Z^3 or Z^4 with the proviso that both radicals Z are not simultaneously Z^4, and in which

Z^3 is a radical of the formula (Ic),

(Ic)



in which

R^2 and R^3 are identical or different and are a hydrogen atom, a substituted or unsubstituted or partly fluorinated or perfluorinated alkyl group having 1 to 20 carbon atoms, or a substituted or unsubstituted or partly fluorinated or perfluorinated alkenyl group having 2 to 20 carbon atoms, possible substituents being hydroxyl, phenyl, cyano, chloro, bromo, C_2–C_4-acyl and C_1–C_4-alkoxy, or

R^2 and R^3 together with the nitrogen atom form a saturated, unsaturated or aromatic heterocyclic ring with or without a further nitrogen, oxygen or sulfur atom in the ring; and

X is a branched or unbranched C_2–C_6-alkylene radical or a C_5–C_7-cycloalkylene radical which can be substituted by from 1 to 4 substituents selected from the group consisting of C_1–C_6-alkyl radicals, hydroxyl radicals, hydroxyalkyl radicals having 1 to 4 carbon atoms and by 1 or 2 C_5–C_7-cycloalkyl radicals; Z^4 is hydrogen, hydroxyl, amino, phenyl, (C_1–C_4alkyl)phenyl or C_1–C_{20}-alkyl, it being possible for the phenyl ring and the alkyl group to be substituted by one or more substituents selected from the group consisting of Cl, Br, CN, OH, C_6H_5, carbamoyl, C_2–C_4-acyl and C_1–C_4-alkoxy and for the phenyl ring to be substituted by NR^2R^3 or for the alkyl group to be perfluorinated or partly fluorinated;

the fractions of the respective components based on the overall weight of the preparation (100% by weight).

US 6,409,817 B1

FINE-CELLED FOAM COMPOSITION AND METHOD HAVING IMPROVED THERMAL INSULATION AND FIRE RETARDANT PROPERTIES

Douglas K. Stephens, Dickinson, Tex., assignor to Agritec, Inc., Houston, Tex.

Continuation-in-part of application No. 08/977,524, filed on Nov. 24, 1997, now Pat. No. 5,858,911, which is a division of application No. 08/677,875, filed on Jul. 10, 1996, now Pat. No. 5,714,000, which is a continuation-in-part of application No. 08/642,925, filed on May 6, 1996, now abandoned. This application May 8, 2000, Appl. No. 566,329.

This patent is subject to a terminal disclaimer.

Int. Cl. C04B *12/04;38/00;38/10*

U.S. Cl. 106—601 **10 Claims**

1. A method of making a rigid fine-celled foam composition having thermal insulation and fire retardant properties in which a majority of its cells are of a size from about 40 to about 60 microns comprising,

foaming a mixture of components comprising,

(a) a caustic silicate solution produced by caustic digestion of biomass ash containing silica and activated carbon, the ash being obtained from thermal pyrolysis of the biomass,

(b) a surface tension depressant,

(c) a polymer forming agent, and

(d) an aqueous slurry of absorbent/adsorbent particles effective to absorb/adsorb free water in the resulting rigid fine-celled foam composition, the activated carbon and absorbent/adsorbent particles being of a size not disruptive of the cells of the rigid fine-celled foam structure,

(e) the mixture being formed into the rigid fine-celled foam.

US 6,409,818 B1

DISPOSABLE WATER RESISTANT FOAMED CONCRETE COVER FOR BULK SALT

Philip S. Johnson, Rockford, Minn., assignor to Cargill, Incorporated, Wayzata, Minn.

Continuation of application No. 09/129,158, filed on Aug. 5, 1998, now Pat. No. 6,136,430. This application Feb. 16, 2000, Appl. No. 505,473.

This patent is subject to a terminal disclaimer.

Int. Cl. C04B *7/19;* **B05D** *1/02*

U.S. Cl. 106—608 **26 Claims**

16. A cured foamed water resistant cover composition provided by spraying a foamed cover composition, the cured foamed cover composition comprising from about 2 to about 14 weight percent cement, from about 0.4 to about 6 weight percent foaming composition, from about 70 to about 97.6 weight percent aggregate, and a water resistant additive in an amount effective for increasing the water resistance of the cured cover composition, the aggregate having a particle size in the range of from about 10 U.S. standard mesh to about 300 U.S. standard mesh, the cured foamed cover composition having a density of at least about 1.6 gram/cm^3.

US 6,409,819 B1

ALKALI ACTIVATED SUPERSULPHATED BINDER

Suz-Chung Ko, Lenzburg, Switzerland, assignor to International Mineral Technology AG, Fribourg, Switzerland

PCT No. PCT/IB99/01218, § 371 Date Jan. 2, 2001, § 102(e) Date Jan. 2, 2001, PCT Pub. No. WO00/00447, PCT Pub. Date Jan. 6, 2000

PCT Filed Jun. 19, 1999, Appl. No. 720,866

Claims priority, application European Pat. Off., Jun. 30, 1998, 98890191

Int. Cl. C04B *07/21*

U.S. Cl. 106—707 **8 Claims**

1. An activated supersulphated aluminosilicate binder containing aluminosilicates, calcium sulphate and an activator containing alkali metal salts, wherein: the aluminosilicates, having an Al_2O_3 content exceeding 5% by weight, are formed by a mixture of blast furnace slag, in an amount exceeding 35% by weight, and materials, in an amount exceeding 5% by weight, selected from a group consisting of clay, marl and fly ash; wherein cement kiln dust, in an amount of from 3 to 10% by weight, is added to the mixture as an activator, and wherein calcium sulphate is used in an amount exceeding 5% by weight.

US 6,409,820 B1

HYDRAULIC BINDER

Denes Novak, Markt Piesting, Austria, assignor to Wopfinger Stein- und Kalkwerke Schmid & Co., Waldegg-Wopfing, and Dipl.Ing. Denes Novak, Markt Piesting, both of Austria

Filed Oct. 24, 2000, Appl. No. 695,447

Claims priority, application Austria, Dec. 23, 1998, A2163/98

Int. Cl. C04B *7/14;7/21*

U.S. Cl. 106—714 **20 Claims**

1. A hydraulic binder comprised of a latently hydraulic bulky blast furnace slag, finely ground to in excess of 5,000 cm^2/g Blaine, containing a sulfate promoter and activating additives, and wherein the latently hydraulic bulky blast furnace slag has substantially the following analysis:

Glassiness: >93%,

SiO_2: 34 to 40% by weight,

CaO: 34 to 37% by weight,

Al_2O_3: >9% by weight, and

$(CaO+MgO)/(Al_2O_3+SiO_2)$: 0.88–0.98.

US 6,409,821 B1

HYDRAULIC BINDER AND CEMENT COMPOSITIONS CONTAINING PHOTOCATALYST PARTICLES

Luigi Cassar, Milan, and Carmine Pepe, Bergamo, both of Italy, assignors to Italcementi S.p.A., Bergamo, Italy

PCT No. PCT/EP97/04008, § 371 Date Sep. 2, 1999, § 102(e) Date Sep. 2, 1999, PCT Pub. No. WO98/05601, PCT Pub. Date Feb. 12, 1998

PCT Filed Jul. 24, 1997, Appl. No. 230,939

Claims priority, application Italy, Aug. 7, 1996, MI96A1722

This patent is subject to a terminal disclaimer.

Int. Cl. C04B *22/06;24/30*

U.S. Cl. 106—733 **11 Claims**

1. Cement composition, containing in bulk photocatalyst particles able to oxidize polluting substances in the presence of light, air, and environmental humidity, said composition comprising water, coarse or fine aggregates, a hydraulic binder and photocatalyst particles selected from the group consisting of tungstic oxide (WO_3), strontium titanate ($SrTiO_3$), calcium titanate and titanium dioxide (TiO_2), or precursor thereof, when the photocatalyst particles are particles of titanium dioxide, at least 5% by weight of said particles of titanium dioxide have the anatase structure, said photocatalyst particles present in an amount ranging from 0.01 to 10.0% by weight with respect to the hydraulic binder.

US 6,409,822 B1

AQUEOUS SUSPENSION INCLUDING A MIXTURE OF AT LEAST ONE AQUEOUS SUSPENSION OF PRECIPITATED SILICA AND OF AT LEAST ONE LATEX

Evelyne Prat, Pantin, and Laurent Frouin, L'Hay les Roses, both of France, assignors to Rhodia Chimie, Courbevoie Cedex, France

PCT No. PCT/FR97/00452, § 371 Date Feb. 4, 1999, § 102(e) Date Feb. 4, 1999, PCT Pub. No. WO97/34849, PCT Pub. Date Sep. 25, 1997

PCT Filed Mar. 13, 1997, Appl. No. 142,840

Claims priority, application France, Mar. 15, 1996, 96 03309

Int. Cl. C04B *40/00*

U.S. Cl. 106—737 11 Claims

1. Aqueous suspension comprising a mixture of at least one aqueous suspension of precipitated silica and of at least one latex, wherein said aqueous suspension of precipitated silica has a solids content of between 10 and 40% by weight, has a viscosity lower than 4×10^{-2} Pa s at a shear of 50 s^{-1} and, after centrifuging at 7500 revolutions per minute for 30 minutes, produces a supernatant containing more than 50% of the weight of the silica initially in suspension, wherein said aqueous suspension is stable with regard to sedimentation for at least three months without stirring.

US 6,409,823 B1

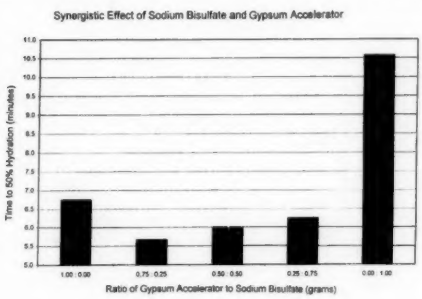
HYDRATION ENHANCING ADDITIVES

Michael Patrick Shake, Oak Lawn, Ill.; Salvatore C. Immordino, Trevor, Wis., and James R. Wittbold, Des Plaines, Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Dec. 28, 1999, Appl. No. 473,347

Int. Cl. C04B *11/00*

U.S. Cl. 106—772 30 Claims



1. An additive for accelerating the setting reaction of calcium sulfate hemihydrate and water comprising a gypsum accelerator combined with a bisulfate salt, said gypsum accelerator comprising a ground calcium sulfate dihydrate and said bisulfate salt being present in an amount of from about 0.1 pounds to about 10 pounds per ton of the dry calcium sulfate hemihydrate.

US 6,409,824 B1

GYPSUM COMPOSITIONS WITH ENHANCED RESISTANCE TO PERMANENT DEFORMATION

Srinivas Veeramasuneni; Qiang Yu, both of Grayslake, and Michael P. Shake, Oak Lawn, all of Ill., assignors to United States Gypsum Company, Libertyville, Ill.

Filed Apr. 25, 2000, Appl. No. 557,721

Int. Cl. C04B *11/00*

U.S. Cl. 106—772 53 Claims

1. A set gypsum-containing composition comprising an interlocking matrix of the set gypsum formed from at least calcined gypsum, water, and an enhancing material comprising a borate comprising ulexite, colemanite, or a mixture of ulexite and colemanite.

US 6,409,825 B1

WET GYPSUM ACCELERATOR AND METHODS, COMPOSITION, AND PRODUCT RELATING THERETO

Qiang Yu, and Srinivas Veeramasuneni, both of Grayslake, Ill., assignors to United States Gypsum Company, Libertyville, Ill.

Filed Nov. 22, 2000, Appl. No. 721,237

Int. Cl. C04B *11/00*

U.S. Cl. 106—776 11 Claims

1. A method of hydrating calcined gypsum to form an interlocking matrix of set gypsum comprising:

forming a mixture of calcined gypsum, water, and a wet gypsum accelerator, said wet gypsum accelerator comprising particles of calcium sulfate dihydrate, water, and at least one additive selected from the group consisting of:

(i) an organic phosphonic compound;

(ii) a phosphate-containing compound; and

(iii) a mixture of (i) and (ii).

US 6,409,826 B2

LOW DEFECT DENSITY, SELF-INTERSTITIAL DOMINATED SILICON

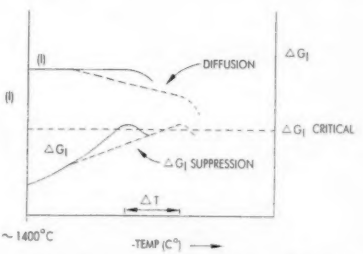
Robert A. Falster, London, United Kingdom; Joseph C. Holzer; Steve A. Markgraf, both of St. Charles, Mo.; Paolo Mutti, Merano, Italy; Seamus A. McQuaid, and Bayard K. Johnson, both of St. Louis, Mo., assignors to MEMC Electronic Materials, Inc., St. Peters, Mo.

Continuation of application No. 09/057,801, filed on Apr. 9, 1998, now Pat. No. 6,254,672, Provisional application No. 60/041,845, filed on Apr. 9, 1997. This application Mar. 23, 2001, Appl. No. 816,015.

This patent is subject to a terminal disclaimer.

Int. Cl. C30B *15/14*

U.S. Cl. 117—13 27 Claims



1. A process for growing a single crystal silicon ingot in which the ingot comprises a central axis, a seed-cone, an end-cone and a constant diameter portion between the seed-cone and the end-cone having a circumferential edge and a radius extending from the central axis to the circumferential edge, the ingot being grown from a silicon melt and then cooled from the solidification temperature in accordance with the Czochralski method, the process comprising:

controlling (i) a growth velocity, v, (ii) an average axial temperature gradient, G_0, during the growth of the constant diameter portion of the crystal over the temperature range from solidification to a temperature of no less than about 1325° C., and (iii) the cooling rate of the crystal from the solidification temperature to about 1,050° C. to cause the formation of an axially symmetrical segment which is substantially free of agglomerated intrinsic point defects wherein the axially symmetric region extends inwardly from the circumferential edge of the ingot, has a width as measured from the circumferential edge radially toward the central axis of the ingot which is at least about three-tenths the length of the radius of the ingot, and has a length as measured along the central axis of at least about two-tenths the length of the constant diameter portion of the ingot, wherein the control of G_0 comprises controlling heat transfer at the melt/solid interface.

US 6,409,827 B2

LOW DEFECT DENSITY SILICON AND A PROCESS FOR PRODUCING LOW DEFECT DENSITY SILICON WHEREIN V/G0 IS CONTROLLED BY CONTROLLING HEAT TRANSFER AT THE MELT/SOLID INTERFACE

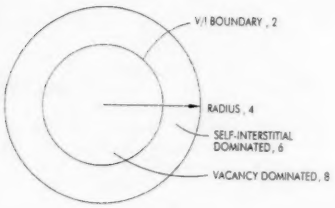
Robert J. Falster, Milan, Italy, and Joseph C. Holzer, St. Charles, Mo., assignors to MEMC Electronic Materials, Inc., St. Peters, Mo.

Continuation of application No. 09/057,907, filed on Apr. 9, 1998, now Pat. No. 6,287,380, Provisional application No. 60/041,845, filed on Apr. 9, 1997. This application Apr. 12, 2001, Appl. No. 833,777.

This patent is subject to a terminal disclaimer.

Int. Cl. C30B *15/14*

U.S. Cl. 117—15 **32 Claims**



7. A process for growing a single crystal silicon ingot in which the ingot comprises a central axis, a seed-cone, an end-cone and a constant diameter portion between the seed-cone and the end-cone having a circumferential edge and a radius extending from the central axis to the circumferential edge, and a nominal diameter of 150 mm, 200 mm, or greater than 200 mm, the ingot being grown from a silicon melt and then cooled from the solidification temperature in accordance with the Czochralski method, the process comprising:

controlling a growth velocity, v, and an instantaneous axial temperature gradient, G_0, of the crystal during the growth of the constant diameter portion of the ingot to cause the formation of an axially symmetrical segment which, upon cooling of the ingot from the solidification temperature, is substantially free of agglomerated intrinsic point defects wherein the axially symmetric region extends inwardly from the circumferential edge of the ingot, has a width as measured from the circumferential edge radially toward the central axis of the ingot which is at least about 30% the length of the radius of the ingot, and has a length as measured along the central axis of at least about 20% the length of the constant diameter portion of the ingot, wherein the control of G_0 comprises controlling heat transfer at the melt/solid interface.

US 6,409,828 B1

METHOD AND APPARATUS FOR ACHIEVING A DESIRED THICKNESS PROFILE IN A FLOW-FLANGE REACTOR

Tae S. Kim, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

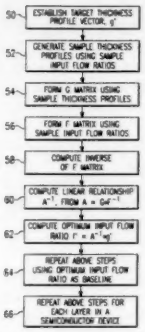
Division of application No. 08/332,192, filed on Oct. 31, 1994, now abandoned. This application Sep. 12, 1995, Appl. No. 526,828.

Int. Cl. C30B *25/16*

U.S. Cl. 117—85 **14 Claims**

1. A method for adjusting gas flow in a flow-flange reactor to achieve a desired thickness profile, comprising the steps of:

establishing a target thickness profile;


50
ESTABLISH TARGET THICKNESS PROFILE VECTOR, q'
52
GENERATE SAMPLE THICKNESS PROFILES USING SAMPLE INPUT FLOW RATIOS
54
FORM G MATRIX USING SAMPLE THICKNESS PROFILES
56
FORM F MATRIX USING SAMPLE INPUT FLOW RATIOS
58
COMPUTE INVERSE OF F MATRIX
60
COMPUTE LINEAR RELATIONSHIP A = GF^-1, FROM A = GF^-1
62
COMPUTE OPTIMUM INPUT FLOW RATIO r' = A^-1 q'
64
REPEAT ABOVE STEPS USING OPTIMUM INPUT FLOW RATIO AS BASELINE
66
REPEAT ABOVE STEPS FOR EACH LAYER IN A SEMICONDUCTOR DEVICE

determining a first set of optimum input-flow ratios in response to said target thickness profile, based upon a first plurality of sample thickness profiles and a first plurality of sets of sample input-flow ratios, each of said sample thickness profiles corresponding to one set of said first plurality of sets of sample input-flow ratios;

calculating from said input-flow ratios a gas flow for each of a plurality of gases supplied to said reactor; and

open-loop control adjusting gas flow to said reactor for each of said plurality of gases to produce said calculated gas flow.

US 6,409,829 B1

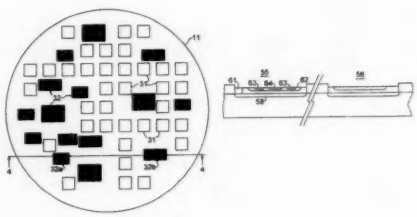
MANUFACTURE OF DIELECTRICALLY ISOLATED INTEGRATED CIRCUITS

John Joseph Bastek, Reading; Thomas J. Krutsick, Fleetwood, and Robert D. Plummer, Robesonia, all of Pa., assignors to Agere Systems Guardian Corp., Orlando, Fla.

Filed Dec. 15, 1999, Appl. No. 461,609

Int. Cl. C30B *23/00*

U.S. Cl. 117—95 **4 Claims**



1. A method for the manufacture of integrated circuit devices comprising the steps of:

(a) forming an insulating layer on a semiconductor substrate,

(b) etching a plurality of openings in the insulator layer extending through the insulating layer and exposing the semiconductor substrate, the plurality of openings comprising passive sites and active device sites, the active device sites being distributed relatively unevenly across the silicon wafer, and the combination of the active device sites and the passive sites having a relatively even distribution across the substrate,

(c) implanting impurities into at least the active device sites,

(d) growing a plurality of semiconductor epitaxial layers in each of the openings, and

(e) forming semiconductor devices in the active device sites leaving the passive sites devoid of devices.

US 6,409,830 B1

PROCESS FOR PREPARING A $LiMO_2$ TYPE HETEROMETALLIC OXIDE FILM

Yun-Soo Kim; Won-Yong Koh, and Su-Jin Ku, all of Daejeon, Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Daejeon, Rep. of Korea

Continuation of application No. PCT/KR98/00394, filed on Dec. 2, 1998, now abandoned. This application Jun. 1, 2000, Appl. No. 585,019.

Claims priority, application Rep. of Korea, Dec. 2, 1998, 97-65147

Int. Cl. C30B *25/00;29/16;* **C23C** *16/18*

U.S. Cl. 117—104 **4 Claims**

1. A process for preparing a heterometallic oxide film of the $LiMO_2$ type on a substrate, which comprises contacting the vapor of a volatile organometallic compound of formula $LiOR'.(R'O)MR_2$ with a substrate heated to a temperature above 300° C., wherein M is a Group 13 element; R is a C_{1-10} alkyl group; and R' is a C_{2-10} alkyl group.

US 6,409,831 B2

APPARATUS FOR FABRICATING SINGLE CRYSTAL

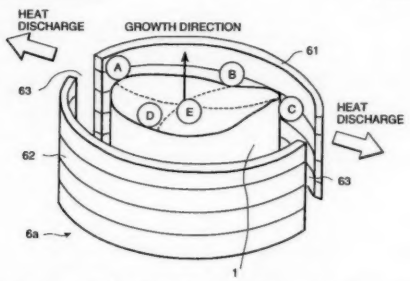
Seiji Mizuniwa; Kenya Itani, and Michinori Wachi, all of Hitachi, Japan, assignors to Hitachi Cable Ltd., Tokyo, Japan

Division of application No. 09/325,129, filed on Jun. 3, 1999, now Pat. No. 6,290,773. This application Mar. 30, 2001, Appl. No. 820,877.

Claims priority, application Japan, Jun. 3, 1998, 10-154014

Int. Cl. C30B *35/00*

U.S. Cl. 117—204 **5 Claims**



1. An apparatus for fabricating a single crystal of a compound semiconductor according to a vertical Bridgman method of growing a single crystal by arranging a crucible on an inner side of a heater of a vertical electrical furnace and gradually solidifying a semiconductor melt from a lower part to an upper part in the crucible, wherein at least a heater part for controlling an interface between solid and melt in said heater which surrounds the crucible is vertically divided into a plurality of parts and gaps for discharging heat of the crucible to outside in a radial direction are formed in a part in a circumferential direction to allow the heat of the crucible to flow not only in a vertical direction but also from said gaps to the outside in the radial direction.

US 6,409,832 B2

PROTEIN CRYSTALLIZATION IN MICROFLUIDIC STRUCTURES

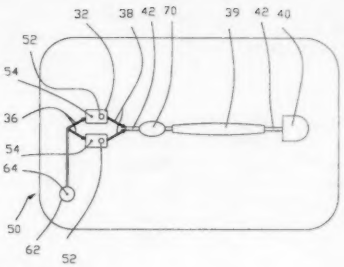
Bernhard H. Weigl, Seattle, Wash., and Jurgen Sygusch, Montréal, Canada, assignors to Micronics, Inc., Redmond, Wash.

Provisional application No. 60/193,867, filed on Mar. 31, 2000. This application Mar. 30, 2001, Appl. No. 822,595.

Int. Cl. C30B *35/00*

U.S. Cl. 117—206 **17 Claims**

1. A device for promoting protein crystallization growth from solution, comprising:



a body structure;

means located within said body structure for introduction of at least one solution containing protein and at least one solution containing a solvent; and

at least one microfluidic channel connected to said introduction means wherein said protein solution and said solvent solution interact to induce formation of protein crystals within said channel.

US 6,409,833 B2

INSULATING-CONTAINING RING-SHAPED HEAT SHIELDS AND SUPPORT MEMBERS FOR CZOCHRALSKI PULLERS

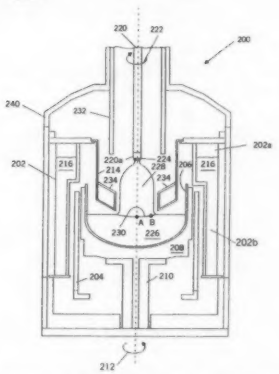
Jea-gun Park, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Division of application No. 09/320,210, filed on May 26, 1999, now Pat. No. 6,251,184, which is a continuation-in-part of application No. 08/989,591, filed on Dec. 12, 1997, now Pat. No. 6,045,610, Provisional application No. 60/063,086, filed on Oct. 24, 1997. This application Mar. 9, 2001, Appl. No. 803,471.

Claims priority, application Rep. of Korea, Feb. 13, 1997, 97-4291; Oct. 24, 1997, 97-54899

Int. Cl. C30B *35/00*

U.S. Cl. 117—217 **2 Claims**



1. A Czochralski puller for growing monocrystalline silicon ingots comprising:

an enclosure;

a crucible in the enclosure that holds a silicon melt;

a seed holder in the enclosure, adjacent the crucible;

a heater in the enclosure, surrounding the crucible;

a heat pack in the enclosure, surrounding the heater;

a ring-shaped heat shield housing within the crucible, comprising inner and outer heat shield housing walls and an oblique heat shield housing floor and a heat shield housing roof that extend between the inner and outer heat shield housing walls, the heat shield housing containing insulating material therein; and

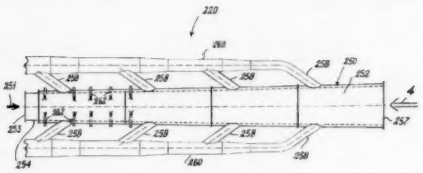
a support member that supports the ring-shaped heat shield housing from the heat pack to within the crucible.

US 6,409,834 B1

GLUING APPARATUS FOR WOOD FIBER PANEL PRODUCTION PLANTS

Luigi Frati, Mantova, Italy, assignor to C.M.P. Costruzioni Meccaniche Pomponesco S.p.A., Pomponesco, Italy

Filed Dec. 22, 1999, Appl. No. 469,483
Claims priority, application Italy, Jan. 25, 1999, MI99A0129
Int. Cl. B05B *17/00*
U.S. Cl. 118—303 15 Claims



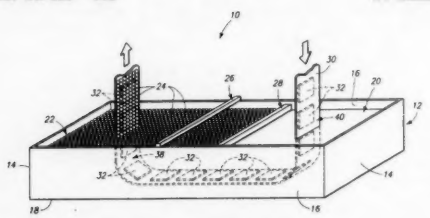
1. A gluing apparatus (**22**) for plants for producing wood fibre panels by a dry method, comprising a tubular body (**250**) and sprayer means (**262**) to inject a suitable liquid glue into the interior of the tubular body (**250**), wherein a cross section of the tubular body defines an area which increases progressively from an open upstream end (**253**) of said tubular body, into which the wood fibres are fed conveyed by an air stream, to an open downstream end (**257**) of said tubular body, the tubular body (**250**) comprising an outer wall (**252**) and an air-permeable inner wall (**254**) spaced from the the outer wall (**252**), the outer wall (**252**) of the tubular body (**250**) having a plurality of apertures for enabling the introduction of additional air streams into said tubular body.

US 6,409,835 B1

APPARATUSES FOR FORMING LAYERS

James J. Alwan, Bosie, Id., assignor to Micron Technology, Inc., Boise, Id.

Division of application No. 09/146,731, filed on Sep. 3, 1998, now Pat. No. 6,068,878. This application Sep. 15, 1999, Appl. No. 396,388.
Int. Cl. B05C *3/00*
U.S. Cl. 118—402 14 Claims



1. A layer forming apparatus, comprising:

a vessel configured to retain a liquid;

a pusher bar joined to the vessel and configured to compress non-fluid particulates on an upper surface of the liquid;

a conveyor which enters and exits the vessel, the conveyor being configured to removably retain substrates and to transport such substrates through the vessel, the conveyor having a front surface that faces the pusher bar and a back surface in opposing orientation relative to the front surface; and

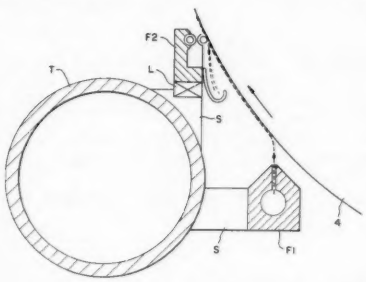
the vessel, conveyor and pusher bar being configured to form a layer of the non-fluid particulates on substrates as the substrates are transported through the vessel by the conveyor, wherein the conveyor comprises lateral edges and wherein the vessel comprises a seal along the lateral edges of the conveyor to prevent the particulates from flowing around the conveyor and contacting the back surface of the conveyor.

US 6,409,836 B1

APPARATUS FOR DIRECT OR INDIRECT APPLICATION OF A LIQUID OR PASTY COATING MEDIUM ONTO A TRAVELING MATERIAL WEB, NOTABLY OF PAPER OR CARDBOARD

Richard Bernert, Giengen, and Friedhelm Ruhl, Steinheim, both of Germany, assignors to Voith Sulzer Papiermaschinen GmbH, Heidenheim, Germany

Continuation of application No. 08/979,057, filed on Nov. 26, 1997, now Pat. No. 6,053,979. This application Apr. 19, 2000, Appl. No. 552,129.
Claims priority, application Germany, Nov. 29, 1996, 196 49 559
Int. Cl. B05C *3/02*
U.S. Cl. 118—413 10 Claims



1. An apparatus for one of direct and indirect application of a coating medium onto a traveling fiber material web having a width, said apparatus comprising:

at least one working unit configured for being wetted by the coating medium and applying the coating medium onto the web, said at least one working unit being associated with the web and having a longitudinal direction substantially parallel to the width of the web;

an support element supporting at least one said working unit and extending substantially parallel to said longitudinal direction;

a fixed-bearing/movable bearing assembly interconnecting said at least one working unit and said support element; and

means for thermally shielding said at least one working unit and said support element from one another, said thermally shielding means comprising at least one substantially solid thermally insulating layer disposed between said at least one working unit and said support element.

US 6,409,837 B1

PROCESSING SYSTEM AND METHOD FOR CHEMICAL VAPOR DEPOSITION OF A METAL LAYER USING A LIQUID PRECURSOR

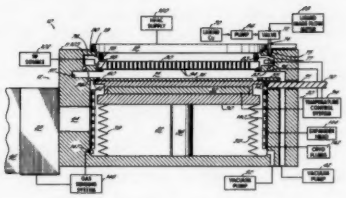
Joseph T. Hillman, Scottsdale, Ariz., assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Jan. 13, 1999, Appl. No. 231,357
This patent is subject to a terminal disclaimer.
Int. Cl. C23C *16/00*
U.S. Cl. 118—712 28 Claims

1. A system for depositing a layer of metal onto a substrate through a chemical vapor deposition process, the system comprising:

a process chamber having a process space therein for receiving and processing a substrate;

a vaporizer element positioned in a vaporization space of the chamber adjacent the process space, the vaporizer element operable for being heated to a temperature sufficient to vapor-



ize a liquid metal-containing precursor into a process gas for delivery to said process space;

a nozzle positioned opposite said vaporizer element and connectable to a liquid metal-containing precursor supply, the nozzle operable to atomize and direct the liquid metal-containing precursor to directly strike against the vaporizer element so that the precursor may be vaporized into the process gas;

a vapor distribution ring positioned between the vaporization space and the process space to disperse the formed process gas into the process space and proximate the substrate, the vapor distribution ring spaced away from the vaporizer element such that the precursor may be predominantly vaporized into a process gas by the vaporizer element before being dispersed through the vapor distribution ring into the process space;

whereby the gas reacts proximate the substrate to deposit a layer of metal thereon.

US 6,409,838 B1

COATING FILM FORMATION APPARATUS AND AGING PROCESS APPARATUS

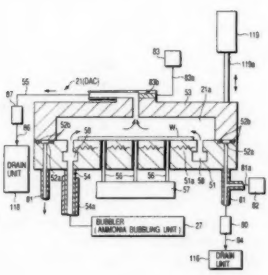
Koji Sakai, Kikuchi-gun, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Nov. 1, 1999, Appl. No. 431,282

Claims priority, application Japan, Nov. 4, 1998, 10-313117

Int. Cl. C23C *16/00*

U.S. Cl. 118—725 **22 Claims**



1. An apparatus for forming a coating film, comprising:

a coating unit for coating a sol containing dielectric particles and a first solvent on a substrate;

an aging unit for changing a sol-state coating film formed on the substrate in the coating unit to a gel state; and

a solvent exchange unit for applying a second solvent different from the first solvent to the coating film to replace the first solvent in the coating film with the second solvent,

wherein the aging unit comprises

a heating plate, which supports the substrate substantially horizontally, for use in heating the substrate;

a cover having a peripheral portion that is in contact with a peripheral portion of the heating plate to form a process chamber surrounding the substrate, together with the heating plate;

a cylinder mechanism configured to press the cover against the heating plate;

an annular groove formed in the peripheral portion of the heating plate;

a vacuum adsorption mechanism having an exhaust passage communicating with the annular groove, for vacuum-evacuating the annular groove, thereby adsorbing the cover to the heating plate;

a chemical solution vapor supply mechanism for supplying a chemical solution vapor to the process chamber;

an evacuation mechanism for evacuating the process chamber to set an inner pressure of the process chamber at a negative value; and

a process chamber pressure monitor for detecting an inner pressure of the process chamber.

US 6,409,839 B1

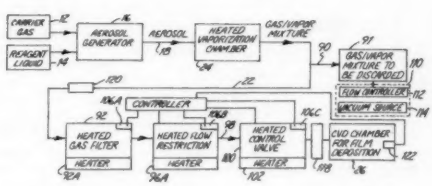
METHOD AND APPARATUS FOR VAPOR GENERATION AND FILM DEPOSITION

James J. Sun, New Brighton, and Benjamin Y. H. Liu, North Oaks, both of Minn., assignors to MSP Corporation, Minneapolis, Minn.

Continuation-in-part of application No. 08/898,662, filed on Jul. 22, 1997, now abandoned, which is a continuation of application No. 08/867,340, filed on Jun. 2, 1997, now abandoned, and a continuation-in-part of application No. PCT/US98/11090, filed on Jun. 1, 1998. This application Nov. 8, 1999, Appl. No. 435,515.

Int. Cl. C23C *16/00*

U.S. Cl. 118—726 **10 Claims**



1. A device to produce a source of a gas stream carrying a vapor of a selected reagent therein comprising an aerosol generator for generating an aerosol in a gas stream, the aerosol generator having a nozzle, a compressed gas source connected to discharge through the nozzle to form the gas stream, a passageway open to the nozzle for a liquid containing the reagent to flow into the passageway to form small droplets containing the selected reagent, a separate vaporization chamber having heated surfaces over which the gas stream passes, the heated surfaces being heated to a temperature to cause vaporization of the droplets carried in the gas stream whereby the gas stream exits the vaporization chamber carrying vapor formed from the droplets, the aerosol generator and the vaporization chamber being mounted in a single housing such that droplets are sprayed directly from the aerosol generator into the vaporization chamber, and an insulated wall between the vaporization chamber and the aerosol generator for reducing heat transfer to the aerosol generator, a separate chemical vapor deposition (CVD) chamber for receiving the gas stream from the vaporization chamber, the separate CVD chamber being connected to the vaporization chamber through a conduit of substantially smaller cross sectional area than the vaporization chamber; and a heated porous gas filter between the vaporization chamber and the separate CVD chamber.

US 6,409,840 B1

HIGH AMYLOSE STARCH AND RESISTANT STARCH FRACTIONS

Kenneth J McNaught, North Epping; Eric Moloney; Ian L Brown, both of Tamworth, and Adrian Timothy Knight, Lane Cove, all of Australia, assignors to Goodman Fielder Limited, New South Wales, Australia

Division of application No. 08/374,645, filed as application No. PCT/AU93/00389, filed on Jul. 30, 1993, now Pat. No. 5,714,600. This application Nov. 12, 1997, Appl. No. 967,826.

Claims priority, application Australia, Jul. 31, 1992, PL3894; Feb. 12, 1993, PL7266

Int. Cl. A01H *5/10;* **C08B** *30/00*

U.S. Cl. 127—32 **5 Claims**

1. A maize starch selected from the group consisting of maize starch having an apparent amylose content of more than 90.1%, physically or chemically modified derivatives of maize starch having an apparent amylose content of more than 90.1%, destructurized maize starch having an apparent amylose content of more than 90.1%, and non-destructurized maize starch having an apparent amylose content of more than 90.1%.

US 6,409,841 B1

PROCESS FOR THE PRODUCTION OF ORGANIC PRODUCTS FROM DIVERSE BIOMASS SOURCES

Charles K. Lombard, East Palo Alto, Calif., assignor to Waste Energy Integrated Systems, LLC., Palo Alto, Calif.

Provisional application No. 60/136,117, filed on Nov. 2, 1999. This application Nov. 2, 2000, Appl. No. 705,424.

Int. Cl. C13K *1/02;* **C13D** *1/00*

U.S. Cl. 127—37 **35 Claims**

1. A method of processing a lignocellulose-containing biomass material, comprising:

treating the biomass material by one or more stages of dilute acid hydrolysis with about 0.4% to 2% strong acid; and

treating an unreacted solid lignocellulostic component of the acid hydrolyzed biomass material by alkaline delignification to produce precursors for biodegradable thermoplastics and derivatives.

US 6,409,842 B1

METHOD FOR TREATING SURFACES OF SUBSTRATES AND APPARATUS

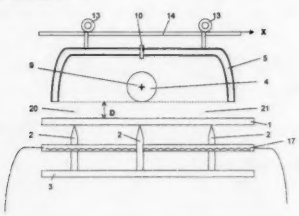
Angelika Roth-Fölsch, Alzenau, and Erich Arnold, Mainz, both of Germany, assignors to Heraeus Noblelight GmbH, Hanau, Germany

Filed Nov. 8, 2000, Appl. No. 709,130

Claims priority, application Germany, Nov. 26, 1999, 199 57 034

Int. Cl. B08B *7/00*

U.S. Cl. 134—1 **9 Claims**



1. A method for treating a surface of an organic or inorganic substrate comprising:

producing reactive fragments by irradiating molecules with ultraviolet radiation produced by at least one ultraviolet radiator as a discharge lamp disposed at a distance away from the substrate, said ultraviolet radiator having a gas-filled, elongated discharge chamber having walls formed by a dielectric, said ultraviolet radiator having at least one electrode on a side facing away from said elongated discharge chamber, wherein during irradiation at least one of a translational or rotary relative movement takes place between the substrate and the ultraviolet radiator.

US 6,409,843 B1

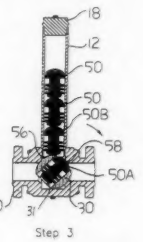
METHOD OF INJECTING PIGS INTO A PIPE

James Richard Ellett, Edmonton, Canada, assignor to Argus Machine Co. Ltd., Edmonton, Canada

Division of application No. 08/800,630, filed on Feb. 14, 1997, now Pat. No. 6,079,074. This application Jun. 27, 2000, Appl. No. 613,057.

Int. Cl. B08B *9/04*

U.S. Cl. 134—8 **6 Claims**



Step 3

1. A method of injecting pigs into a pipe at a pig injector valve, in which the pig injector valve has an interior rotatable ball with a bore formed within the ball, the bore and the ball forming a rotatable pig receiving chamber having a length L, the method comprising:

(a) storing plural pigs in a magazine connected to the pig injector valve;

(b) rotating the ball of the pig injector valve to be in position to receive a pig and to stop the flow of fluid in the pipe;

(c) moving a pig from the magazine into the pig injector valve;

(d) rotating the ball of the pig injector valve to open the pig injector valve, thereby restoring the flow of fluid in the pipe, in order to release the pig in the pipe;

(e) moving the pig away from the pig injector valve with fluid pressure in the pipe; and

(f) subsequently repeating steps (b)–(e) with a second pig.

US 6,409,844 B1

SURFACE-TREATED ARTICLE OF MAGNESIUM OR MAGNESIUM ALLOYS, METHOD OF SURFACE PREPARATION AND METHOD OF COATING

Naohiro Shikata, Toyono-gun; Yoshiaki Kondou, Amagasaki; Yukio Nishikawa, Ikeda; Yoshihiko Nishizawa, Kurashiki; Yoshinori Sakamoto, Settsu, and Takeshi Fujiwaki, Kurashiki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP99/01275, § 371 Date Aug. 30, 2000, § 102(e) Date Aug. 30, 2000, PCT Pub. No. WO99/47729, PCT Pub. Date Sep. 23, 1999

PCT Filed Mar. 16, 1999, Appl. No. 623,218

Claims priority, application Japan, Mar. 17, 1998, 10-067116; Feb. 2, 1999, 11-024956

Int. Cl. C23C *22/07*

U.S. Cl. 148—261 **5 Claims**

1. A method for the surface preparation of an article of magnesium or its alloy comprising treating the article with a treating liquid which contains

1,000 to 20,000 ppm of alkali metal ions,

1,000 to 50,000 ppm of condensed phosphate ions, and

100 to 20,000 ppm of borate ions,

and has pH of at least 8.

US 6,409,845 B1

ELASTIC COMPONENT FOR A PRECISION INSTRUMENT AND PROCESS FOR ITS MANUFACTURE

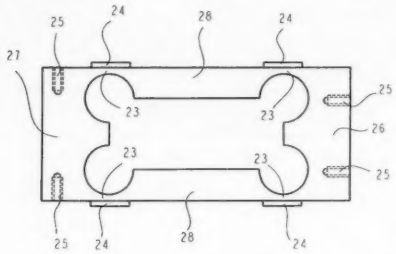
Jean-Maurice Tellenbach, Hettlingen, Switzerland, assignor to Mettler-Toledo GmbH, Greifensee, Switzerland

Filed Mar. 26, 1999, Appl. No. 277,176

Claims priority, application Germany, Mar. 26, 1998, 198 13 459

Int. Cl. C22C *38/18*

U.S. Cl. 148—325 **18 Claims**



1. An elastic component for a measuring device in which deformation of the component is in linear proportion to an applied mechanical load, comprising an austenitic metal alloy that includes:

interstitial atoms; contains in proportion to its total weight less than two percent ferrite;

contains in proportion to its total weight less than two percent martensite; and

contains in proportion to its total weight more than eleven percent chromium, and has a crystalline texture with a nanostructure with blocked dislocations.

US 6,409,846 B1

ROLLING BEARING

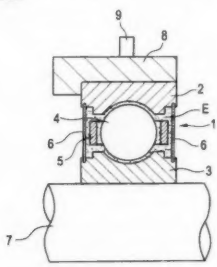
Hiromichi Takemura; Susumu Tanaka, and Shigeru Okita, all of Kanagawa, Japan, assignors to NSK, Ltd., Tokyo, Japan

Filed Mar. 17, 2000, Appl. No. 527,245

Claims priority, application Japan, Mar. 19, 1999, 11-076745; Dec. 28, 1999, 11-375661

Int. Cl. C22C *38/22;38/24;38/18*

U.S. Cl. 148—325 **10 Claims**



1. A rolling bearing comprising a fixed race, a rotary race and a plurality of rolling elements disposed between said fixed race and said rotary race;

wherein at least said fixed race is made of a steel comprising from 0.35 to 0.55% by weight of C, from 11.0 to 17.0% by weight of Cr, from 0.05 to less than 0.22 by weight of N and the rest of Fe and unavoidable components,

further wherein the sum of the content of C and N is from 0.45 to 0.65% by weight or less, and exhibits a surface hardness HRC of 57 or more after heat treatment and the diameter of eutectic carbide produced at least on said bearing rolling surface of the races is 10 μm or less,

wherein said steel further comprises at least one of 3.0% by weight or less of Mo and 2.0% by weight or less of V, and

wherein a thickness of a passive film is from 5 nm to 100 nm at least on said bearing rolling surface of the races.

US 6,409,847 B2

AUSTENITIC NICKEL-CHROMIUM STEEL ALLOYS

Willi Kleemann, Moerlenbach, Germany, assignor to Schmidt & Clemens GmbH & Co., Lindlar, Germany

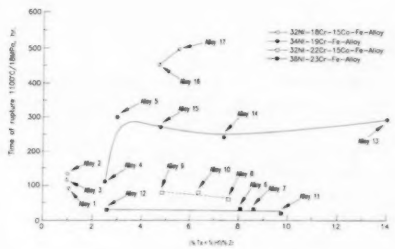
PCT No. PCT/EP97/03975, § 371 Date May 10, 1999, § 102(e) Date May 10, 1999, PCT Pub. No. WO98/04757, PCT Pub. Date Feb. 5, 1998

PCT Filed Jul. 23, 1997, Appl. No. 230,417

Claims priority, application Germany, Jul. 25, 1996, 196 29 977

Int. Cl. C22C *19/05;38/44*

U.S. Cl. 148—327 **12 Claims**



1. Heat resistant and high hot strength austenitic nickel chromium alloy steel with high stress rupture strength and carburisation resistance, consisting essentially of:

0.3 to 1.0% carbon,

0.2 to 2.5% silicon,

up to 0.8% manganese,

30.0 to 48.0% nickel,

16.0 to 22% chromium,

0.5 to 18.0% cobalt,

1.5 to 4% molybdenum,

0.2 to 0.6% niobium,

0.1 to 0.5% titanium,

0.1 to 0.6% zirconium,

0.1 to 1.5% tantalum,

0.1 to 1.5% hafnium,

balance more than 20% iron when the cobalt content is at least 10%, the ratio of the total content of tantalum and hafnium to the content of zirconium being over 2.4, with a total content of tantalum, hafnium and zirconium of 1.2 to 3.0% and optionally 1.5 to 2.5% aluminum.

US 6,409,848 B1

CREEP RESISTANT NB-SILICIDE BASED MULTIPHASE COMPOSITES

Bernard Patrick Bewlay, and Melvin Robert Jackson, both of Niskayuna, N.Y., assignors to General Electric Company, Schenectady, N.Y.

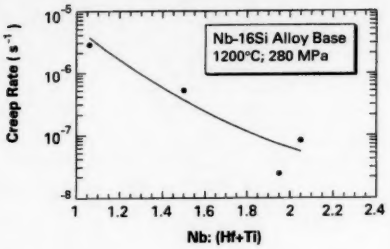
Filed Aug. 24, 2000, Appl. No. 651,574

Int. Cl. C22C *27/02*

U.S. Cl. 148—422 **33 Claims**

1. A niobium-based silicide composite exhibiting creep resistance at temperatures equal to or greater than 1150° C., the niobium-based silicide composite comprising:

at least silicon (Si), hafnium (Hf), titanium (Ti), niobium (Nb), and tin (Sn), wherein a concentration ratio of Nb:(Hf+Ti) is equal to or greater than about 1.4 and the niobium-based



silicide composite exhibits a creep rate less than about $5\times10^{-8}s^{-1}$ at temperatures up to about 1200° C. and at a stress of about 200 MPa.

US 6,409,849 B1

METHOD OF PRODUCING HYDROGEN-ABSORBING ALLOY FOR NICKEL-HYDROGEN ALKALINE STORAGE CELL

Tadashi Ise, Itano-gun, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 30, 2000, Appl. No. 650,754

Claims priority, application Japan, Aug. 31, 1999, P11-244451

Int. Cl. B22F *1/00;1/02*

U.S. Cl. 148—513 **17 Claims**

1. A method of producing a hydrogen-absorbing alloy for use in a nickel-hydrogen alkaline storage cell, comprising the steps of:

(a) immersing a hydrogen-absorbing alloy in an alkali treatment solution having a temperature of 60° C. or higher to dissolve a metal oxide out of a surface of said hydrogen-absorbing alloy;

(b) after said step (a), adding a pH-adjusting agent and a reducing agent to said alkali treatment solution to deposit a metal from metal ions in said alkali treatment solution; and

(c) washing said hydrogen-absorbing alloy treated by said step (b).

US 6,409,850 B1

FLUXING AGENTS FOR THE REFLOWING OF ELECTRO-DEPOSITED TINPLATE

Cavan Hugh O'Driscoll, 61 East View, Barlby Road, Selby, North Yorkshire Y08 7BA, United Kingdom; Himashu Sohda, 2 Coppicewood Grove, Lidget Green, Bradford, West Yorkshire BD7 2JB, United Kingdom, and Michael Lancaster, Orchard House, Sands Lane, Ellerker, E. Yorks HU15 2DR, United Kingdom

PCT No. PCT/GB97/02498, § 371 Date Nov. 3, 1999, § 102(e) Date Nov. 3, 1999, PCT Pub. No. WO98/13538, PCT Pub. Date Apr. 2, 1998

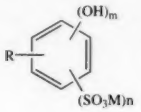
PCT Filed Sep. 15, 1997, Appl. No. 147,972

Claims priority, application United Kingdom, Sep. 27, 1996, 9620357

Int. Cl. C25D *11/00;5/50;* **C21D** *9/08*

U.S. Cl. 148—528 **8 Claims**

1. A process for treating matte tinplate prior to reflow, which process comprises contacting the tinplate with a composition comprising an aqueous solution of one or more hydroxy phenyl compounds of the following structure:



wherein:

M is a cationic species selected from the group consisting of hydrogen, substituted or unsubstituted ammonium, alkali metal, alkaline earth metal and tin;

R is a substituent selected from the group consisting of hydrogen, C_1–C_6 linear or branched alkyl, alkoxyl, alkenyl, and aryl;

m is 2 or 3; and

n is 1 or 2.

US 6,409,851 B1

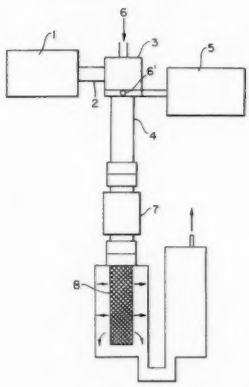
MICROWAVE PLASMA CHEMICAL SYNTHESIS OF ULTRAFINE POWDERS

Krupashankara M. Sethuram, Falls Church, and Raja Kalyanaraman, Fairfax, both of Va., assignors to Materials Modifciation, Inc., Fairfax, Va.

Continuation of application No. PCT/US97/20917, filed on Nov. 4, 1997, Provisional application No. 60/030,188, filed on Nov. 4, 1996. This application Mar. 5, 1999, Appl. No. 262,848.

Int. Cl. C23C *16/511;16/513*

U.S. Cl. 148—565 **16 Claims**



12. A method for the microwave synthesis of materials, said method comprising:

introducing a plasma gas into a microwave applicator;

introducing at least one reactant into the microwave applicator;

generating a microwave in a microwave generator;

directing the microwave into the microwave applicator containing the plasma gas to create a heated plasma in a plasma zone;

absorbing the microwave to reduce the microwave reflection off of a surface of the microwave applicator by at least 60%; and

causing a reaction in the plasma zone thereby converting the at least one reactant into a reaction product.

US 6,409,852 B1

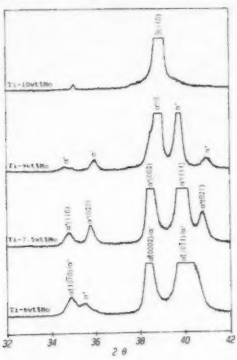
BIOCOMPATIBLE LOW MODULUS TITANIUM ALLOY FOR MEDICAL IMPLANT

Jiin-Huey Chern Lin, Kaoshiung; Chien-Ping Ju, Room 607, No. 350, Tung Feng Rd., Tainan, and Wen-Fu Ho, Tainan Hsien, all of Taiwan, assignors to Jiin-Huey Chern, Kaohsiung, and Chien-Ping Ju, Tainan, both of Taiwan

Filed Jan. 7, 1999, Appl. No. 226,204

Int. Cl. C22F *1/18*

U.S. Cl. 148—669 **11 Claims**



1. A medical implant consisting essentially of a biocompatible titanium alloy containing α" phase as a major phase, said alloy consisting essentially of from about 6 to about 9 wt % of molybdenum, from 0 to 1 wt % of an alloying element and the balance titanium, wherein said alloying element is selected from the group consisting of niobium, zirconium and the mixture thereof.

US 6,409,853 B1

LARGE FORGING MANUFACTURING PROCESS

Samuel V. Thamboo, Latham, and Ling Yang, Niskayuna, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 25, 1999, Appl. No. 426,306

Int. Cl. C22F *1/10*

U.S. Cl. 148—677 **6 Claims**

1. A process for forging a gas turbine component having a weight of at least 10,000 lbs. from Alloy 718 material so that the component does not exhibit any abnormal grain growth, comprising the steps of:

a) providing a billet with an average grain size between ASTM 0 and ASTM 3;

b) heating the billet to a temperature of between 1750° and 1800° F.;

c) upsetting the billet to obtain a component part with a minimum strain of 0.125 in at least selected areas of the part;

d) reheating the component part to a temperature between 1750° and 1800° F.;

e) upsetting the component part to a final configuration such that no areas of the component part receive strains between 0.01 and 0.125;

f) solution treating the selected areas of the component part at a temperature of between 1725° F. and 1750° F.; and

g) aging the selected areas of the component part over predetermined times at different temperatures.

US 6,409,854 B1

LOW BURNING RATE, REDUCED HAZARD, HIGH TEMPERATURE INCENDIARY

Robert C. Gill, White Plains; Carl Gotzmer, Accokeek; Pamela Carpenter, and Eric Schlegel, both of Indian Head, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 27, 2000, Appl. No. 697,246

Int. Cl. C06B *45/10;21/00*

U.S. Cl. 149—19.9 **11 Claims**

1. A low burn rate, high temperature incendiary composition comprising:

a reactive material of titanium;

a second reactive material of boron;

an oxidizer of polytetrafluoroethylene in an amount of from about 10 weight percent or less of the composition; and,

carboxyl terminated butadiene/acrylonitrile copolymer (CTBN) binder in an amount of from about 5 weight percent or greater; wherein the ratio of titanium to boron ranges from about 81/19 to about 69/31.

US 6,409,855 B1

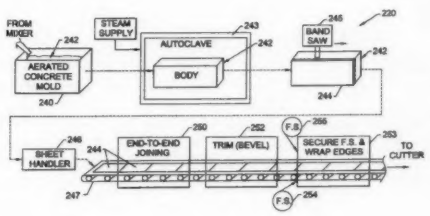
METHOD FOR MAKING WALLBOARD OR BACKERBOARD SHEETS INCLUDING AERATED CONCRETE

Frederick Browne Gregg, Leesburg, and Leslie G. Bromwell, Auburndale, both of Fla., assignors to Consolidated Minerals, Inc., Leesburg, Fla.

Provisional application No. 60/158,172, filed on Oct. 6, 1999. This application Oct. 6, 2000, Appl. No. 680,720.

Int. Cl. B28B *11/14;* **B32B** *5/18*

U.S. Cl. 156—43 **29 Claims**



1. A method for making wallboard or backerboard sheets comprising;

forming core material into a plurality of sheets, each having opposing first and second major surfaces and comprising aerated concrete;

joining the sheets of core material together in end-to-end relation and while advancing the joined-together sheets of core material along a path of travel;

securing at least one face layer on at least one of the first and second major surfaces or the joined-together sheets of core material while advancing the joined-together sheets of core material along the path of travel; and

cutting the joined-together sheets of core material and at least one face layer secured thereto into a plurality of wallboard or backerboard sheets while the joined-together sheets of core material and at least one face layer secured thereto are advanced along the path of travel.

US 6,409,856 B1

APPARATUS FOR SMOOTHING OUT THE SURFACE WEIGHT DISTRIBUTION OF MATS

Dieter Wiemann, Barsinghausen, Germany, assignor to Bison-Werke Baehre & Greten GmbH & Co. KG, Springe, Germany

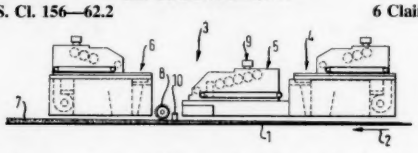
Filed Mar. 24, 1995, Appl. No. 410,182

Claims priority, application Germany, Feb. 2, 1995, 195 03 407

This patent is subject to a terminal disclaimer.

Int. Cl. B27N *3/02;5/00*

U.S. Cl. 156—62.2 **6 Claims**



1. Apparatus for smoothing a surface of a mat having at least one layer including at least one of lignocellulose particles and cellulose particles and a binding agent dispersed therein for manufacturing shaped articles, the apparatus comprising a mat carrier for moving the mat in a given direction; first and second reverse brushing rollers extending at least over a part of a width of the mat and being adjustable relative to the mat carrier in at least one of a horizontal direction and a vertical direction, the reverse brushing rollers having flexible bristles, the bristles being positioned so that they contact the mat and the brushing roller rotating in a direction so that the bristles contacting the mat move in a direction opposite to the given direction, the first and second reverse brushing rollers being further axially inclined with respect to each other to form a V-shaped roller arrangement and displaced with respect to each other in the given direction; at least one scattering head and a metering bunker associated therewith located in a region of the reverse brushing roller; one of a cleaning strip and a cleaning brush cooperating with each reverse brushing roller, the cleaning brush having flexible bristles and rotating in a direction opposite to the direction of rotation of the reverse brushing roller; and means for receiving and returning particles removed from the mat to the metering bunker.

US 6,409,857 B2

DEVICE FOR MANUFACTURING A COMPOSITE SHEET

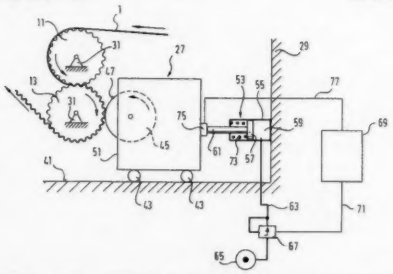
Dieter Pallas, Lentforden; Jorg Vonderheiden, and Jens Schulz, both of Hamburg, all of Germany, assignors to Peters Machinenfabrik GmbH, Hamburg, Germany

Filed Apr. 2, 1998, Appl. No. 53,814

Claims priority, application Germany, Apr. 11, 1997, 197 15 174

Int. Cl. B32B *31/00;* **B31F** *1/00*

U.S. Cl. 156—64 **18 Claims**



1. Method for manufacturing a composite sheet (**5**) comprising at least one corrugated sheet (**1**) and at least one flat sheet (**3**), which is glued to the wave peaks of the corrugated sheet (**1**), said method comprising:

(a) covering a portion of the circumference of at least one fluted roller (**13**) with the corrugated sheet (**1**) during operation;

(b) applying a continuous film of a liquid glue, used to attach the corrugated sheet (**1**) to the flat sheet (**3**), to the outer surface (**47**) of a gluing roller (**45**) of a gluing unit (**27**), the axis of said gluing roller being essentially parallel to that of the fluted roller (**13**);

(c) driving said gluing roller at approximately the same peripheral speed as that of the fluted roller (**13**);

(d) moving said gluing roller (**45**) closer to the fluted roller (**13**), with the outer surface (**47**) of the gluing roller pressing against the portion of the circumference of the fluted roller (**13**) that is covered with the corrugated sheet (**1**), thus pressing the gluing roller (**45**) against the corrugated sheet (**1**) and the corrugated sheet (**1**) against the fluted roller (**13**), thus forming a gluing gap allowing the glue to be transmitted to the wave peaks of the corrugated sheet (**1**);

(e) setting a predetermined compressive force between the gluing roller (**45**) and the fluted roller (**13**) with a maximum line pressure of between 0.1 N/mm and 10.0 N/mm; and

(f) controlling movement of the rollers closer together (**53**, **65**, **67**, **69**) with a control means (**67**, **69**) for the controlled maintenance of the predetermined compressive force between the gluing roller (**45**) and the fluted roller (**13**) during operation of the method.

US 6,409,858 B1

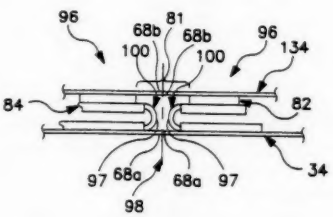
PROCESS FOR MAKING A GARMENT WITH REFASTENABLE LAP SEAMS

Robert Lee Popp, Hortonville; Joseph D. Coenen, Neenah; Jack L. Couillard, Menasha; Christopher Peter Olson, and David Arthur Kuen, both of Neenah, all of Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed May 16, 2000, Appl. No. 571,905

Int. Cl. A61F *13/15*

U.S. Cl. 156—66 **27 Claims**



21. A method of producing refastenable side seams in an absorbent garment, comprising the steps of:

bonding a fastening component along a distal edge of each of a first side panel and a second side panel of a garment assembly;

folding two mating fastening components each with a single fold, each of the mating fastening components having a fist surface and a second surface with a plurality of engaging elements projecting from file first surface;

bonding a portion of the first surface of one of the mating fastening components to each of a third side panel and a fourth side panel of the garment assembly with folded edges of the mating fastening components facing a distal edge of the side panel to which each mating fastening component is attached; and

folding the garment assembly to place the folded mating fastening components on the third and fourth side panels in contact with the fastening components on the first and second side panels, thereby releasably attaching the folded mating fastening components to the fastening components, wherein the mating fastening components can be unfolded to form a lap seam.

US 6,409,859 B1

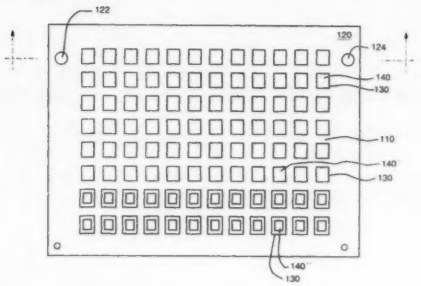
METHOD OF MAKING A LAMINATED ADHESIVE LID, AS FOR AN ELECTRONIC DEVICE

Kevin Kwong-Tai Chung, Princeton Township, N.J., assignor to Amerasia International Technology, Inc., Princeton Junction, N.J.

Provisional application No. 60/091,333, filed on Jun. 30, 1998. This application Jun. 21, 1999, Appl. No. 337,453.

Int. Cl. B32B *31/18*

U.S. Cl. 156—69 **29 Claims**



1. A method for making a plurality of laminated lids each having a bonding pattern of flexible adhesive laminated thereto comprising;

laminating a sheet of lid material and a flexible adhesive having a coefficient of elasticity of less than about 200,000 psi and an elongation of at least about 10% before fracture,

wherein said laminating comprises depositing a pattern of the flexible adhesive including a plurality of bonding patterns on the sheet of lid material;

wherein said laminating further comprises depositing an interface material in a plurality of areas on the sheet of lid material defined by the plurality of bonding patterns; and

then stamping said plurality of lids out of said laminated sheet of lid material and flexible adhesive,

whereby plural lids each having a bonding pattern of flexible adhesive laminated thereto are made.

US 6,409,860 B1

METHOD FOR ADHERING A FLOOR COVERING TO A FLOOR WITH A FLOOR ADHESIVE

Peter Fickeisen, Dirmstein; Oral Aydin, Mannheim; Eckehardt Wistuba, Bad Dürkheim; Thomas Schwerzel, Meckenheim; Rüdiger Füssl, Neustadt, and Dieter Urban, Speyer, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP95/00350, § 371 Date Aug. 9, 1996, § 102(e) Date Aug. 9, 1996, PCT Pub. No. WO95/21884, PCT Pub. Date Aug. 17, 1995

PCT Filed Feb. 1, 1995, Appl. No. 687,427

Claims priority, application Germany, Feb. 11, 1994, 44 04 411

Int. Cl. E04B *2/00*

U.S. Cl. 156—71 **8 Claims**

1. A method, comprising adhering a floor covering to a floor with a floor adhesive comprising an aqueous composition, free of organic solvents, plasticizers, and additional tackifiers, containing water and

20–99% by weight of a polymer having a glass transition temperature below −25° C., the polymer being composed (1) of from 60 to 100% by weight of C_1–C_{20}-alkyl (meth)acrylates, vinyl esters of carboxylic acids of up to 20 carbon atoms, vinyl aromatics of up to 20 carbon atoms, ethylenically unsaturated nitrites, vinyl halides, non-aromatic hydrocarbons having at least two conjugated double bonds or mixtures of these monomers, and

1–80% by weight of a filler,

the percentages by weight being based on the sum of the components of the aqueous composition, with the exception of water, the floor adhesive being applied to one side of the floor covering.

US 6,409,861 B1

METHOD OF DETERMINING TREAD PATTERN

Naoki Yukawa, Takarazuka, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

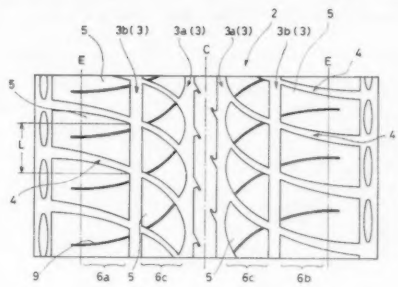
Continuation of application No. 08/982,473, filed on Dec. 2, 1997, now Pat. No. 6,109,318. This application Mar. 22, 2000, Appl. No. 533,111.

Claims priority, application Japan, Dec. 4, 1996, 8-324386

This patent is subject to a terminal disclaimer.

Int. Cl. B29D *30/00;* **B60C** *11/03;113/00*

U.S. Cl. 156—110.1 **10 Claims**



1. A method of determining a tread pattern for a pneumatic tire, the tread pattern comprising a series of design-cycles repeating in the tire circumference at variable pitches (L) in a sequence,

the method comprising the steps of:

selecting a number (NC) of the design-cycles from a range of from 50 to 90;

selecting a number (NP) of different kinds of the variable pitches (L) from a range of at least 10;

setting a maximum pitch (PL) and a minimum pitch (PS) in the variable pitches (L) such that the maximum pitch (PL) is in the range of from 120 to 170% of the minimum pitch (PS);

defining a standard long pitch (PLa) as the maximum pitch (PL) minus a length of 0.2 times a maximum pitch difference (MPD), the maximum pitch difference (MPD) being the maximum pitch (PL) minus the minimum pitch (PS);

defining a standard short pitch (PSa) as the minimum pitch (PS) plus a length of 0.2 times the maximum pitch difference (MPD);

defining an arrangement of the variable pitches as alternately increasing and decreasing in one circumferential direction of the tire;

defining some of the design-cycles as start-cycles from which the pitch starts to increase;

defining a unit (U) as a group of design-cycles starting from one of the start-cycles inclusive to the next start-cycle exclusive;

defining a first unit as including at least one pitch which is not less than the standard long pitch (PLa) and at least one pitch which is not more than the standard short pitch (PSa);

defining a second unit as including at least one pitch within one of a first range of not less than the standard long pitch (PLa) and a second range of not more than the standard short pitch (PSa) but not including a pitch within the other range;

defining a third unit as all the pitches therein are more than the standard short pitch (PSa) and less than the standard long pitch (PLa);

selecting a total number of the units (U) in the sequence from a range of from 4 to 20;

selecting a number of the first units from a range of from 20 to 80% of the total number;

selecting a number of the second units from a range of from 20 to 80% of the total number;

selecting a number of the third unit(s) from a range of from 0 to 60% of the total number; and

determining a tread pattern composed of a series of units based on the selected first units, second units and third units.

US 6,409,862 B1

PROCESS FOR PRODUCING BIAXIALLY ORIENTED PET FILMS AND USE OF THE SAME FOR SMD-TECHNOLOGY FILM CAPACITORS

Holger Kliesch, Mainz-Kastel; Gottfried Hilkert, Saulheim; Rainer Kurz, Hettenheim; Franz Hora, Kriftel, and Annegrete Bursch, Ruedesheim, all of Germany, assignors to Mitsubishi Polyester Film GmbH, Wiesbaden, Germany

Filed Aug. 27, 1999, Appl. No. 384,217

Claims priority, application Germany, Aug. 27, 1998, 198 39 007

Int. Cl. B60C *11/00*

U.S. Cl. 156—184 **7 Claims**

1. A process for producing a biaxially oriented film of thickness <10 μm, which comprises:

(A) extruding a polymer melt through the gap of an extrusion die onto a chill roll to produce a film;

(B) stretching the film longitudinally and transversely;

(C) relaxing the film longitudinally by >0.1% and transversely by >3%, where the edges of the film are held during the longitudinal and transverse relaxation; and

(D) winding the film.

US 6,409,863 B1

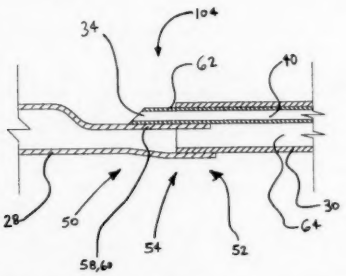
METHODS OF FABRICATING A CATHETER SHAFT HAVING ONE OR MORE GUIDEWIRE PORTS

Brett A. Williams, Lino Lakes; Katherine M. Prindle, Robbinsdale, and Timothy M. Stivland, Plymouth, all of Minn., assignors to Scimed Life Systems, Inc., Maple Grove, Minn.

Filed Jun. 12, 2000, Appl. No. 591,753

Int. Cl. A61M *25/10;25/16*

U.S. Cl. 156—198 **28 Claims**



1. A method of forming a catheter shaft having a guidewire port, the method comprising the steps of;

providing a first shaft portion having a bonding portion disposed proximate a bonding end thereof, an ancillary end, and a lumen extending therethrough;

providing a second shaft portion having a bonding portion disposed proximate a bonding end thereof, an ancillary end, and a lumen extending therethrough;

providing an inner member having a proximal end, a distal end, and a lumen extending therebetween;

slitting a wall of the first shaft portion to create an opening defined by the wall of the first shaft portion;

inserting the proximal end of the inner member through the opening defined by the wall of the first shaft portion;

inserting the distal end of the inner member into the lumen of the second shaft portion;

inserting the bonding end of the second shaft portion into a lumen defined by bonding portion of the first shaft portion such that the bonding portion of the first shaft portion overlays the bonding portion of the second shaft portion; and

bonding the bonding portion of the first shaft portion to the bonding portion of the second shaft portion.

US 6,409,864 B1

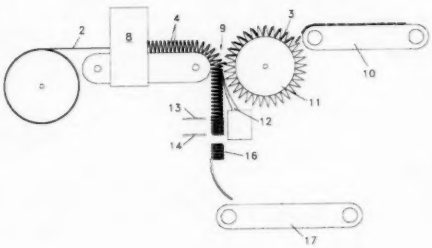
METHOD OF ASSEMBLY OF PLEATED FILTER WITH SPACER INSERT

Kyung-Ju Choi, Louisville, Ky., assignor to AAF International, Inc., Louisville, Ky.

Division of application No. 09/100,985, filed on Jun. 22, 1998, now Pat. No. 6,045,597. This application Feb. 3, 2000, Appl. No. 498,377.

Int. Cl. B01D *27/06*

U.S. Cl. 156—207 **6 Claims**



1. A method of forming a pleated filter comprising: passing a flat strip of filter medium of preselected width into a pleating zone to pleat the filter medium into adjacent pleats having opposed faces of preselected depth with troughs therebetween; passing said pleated filter medium from said pleating zone into a spacer insert zone to insert an individual and separate selected spacer member have a longitudinally extending screen-forming body portion with selectively spaced, crossing strand sets, each set including a plurality of like strands, into each of said troughs to extend longitudinally along the length of each of said troughs with the selectively spaced crossing strand of one set having differing preselected cross-sections from the other set and positioned between opposed filter medium faces of adjacent pleats to provide sufficient thickness and flow-through openings to separate said adjacent pleats and maximize fluid flow through said pleats by insuring the spacing between adjacent pleats and insuring fluid flow through said crossing strand sets; and, passing said spacer inserted pleated filter medium from said spacer insert zone to a severing zone to separate said spacer inserted pleated filter medium into preselected lengths of spacer inserted pleated filter medium units.

US 6,409,865 B1

BICYCLE SADDLE PRODUCTION METHOD

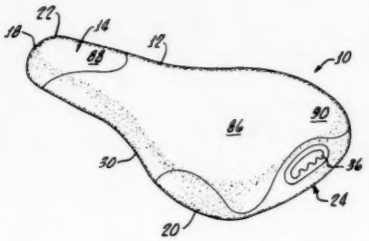
Paul M. Yates, 5814 Briar Tree Dr., LaCanada, Calif. 91011

Filed May 1, 2000, Appl. No. 562,083

Int. Cl. B62J *1/18*

U.S. Cl. 156—214 **12 Claims**

1. A method for making a bicycle saddle comprising the steps of: providing a fabric having a selected perimeter contour;



providing a plastic film with a selected cutout portion therein;

heat sealing the plastic film to one side of the fabric before disposing the fabric into a mold with the plastic film facing the mold cavity;

disposing the fabric into the mold with the fabric perimeter surrounding a mold cavity, the cavity having a bicycle saddle contour;

disposing a polymer into the mold cavity and onto the fabric;

conforming the fabric to the mold cavity with heated polymer to form a shaped elastomer adhering to the fabric in order to permanently contour the fabric in the shape of the bicycle saddle contour;

providing a bicycle saddle shell; and

wrapping the contoured fabric over the shell adhering the contoured fabric to an underside of the shell.

US 6,409,866 B1

PROCESS FOR MOUNTING SEMICONDUCTOR DEVICE

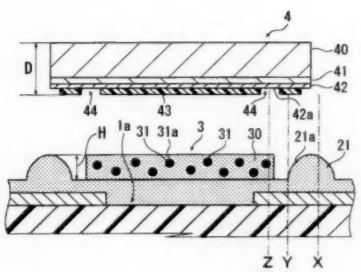
Yukio Yamada, Tochigi, Japan, assignor to Sony Chemicals Corp., Tokyo, Japan

Filed May 3, 2000, Appl. No. 563,508

Claims priority, application Japan, May 28, 1999, 11-149801

Int. Cl. H01L *23/12;* **H05K** *3/30*

U.S. Cl. 156—219 **28 Claims**



1. A process for mounting a semiconductor device on a wiring board, comprising:

tentatively thermocompression bonding a conductive particle-free insulating adhesive onto a wiring board to thereby form an insulating adhesive layer;

forming a concave of a predetermined size in said insulating adhesive layer;

putting, in the concave of said insulating adhesive layer, an anisotropic conductive adhesive film having conductive particles dispersed in an insulating adhesive; and

putting at least a portion of a semiconductor device into the concave of said insulating adhesive layer followed by positioning and thermocompression bonding.

US 6,409,867 B1

EXTRUSION OF POLYMER-BASED CELL COMPONENTS

Esam Kronfli, Swindon, and Neville John Mattingley, Wantage, both of United Kingdom, assignors to Accentus PLC, Didcot, United Kingdom

PCT No. PCT/GB98/02167, § 371 Date Jan. 19, 2000, § 102(e) Date Jan. 19, 2000, PCT Pub. No. WO99/05744, PCT Pub. Date Feb. 4, 1999

PCT Filed Jul. 20, 1998, Appl. No. 463,020

Claims priority, application United Kingdom, Jul. 23, 1997, 9715392

Int. Cl. H01M *4/04;10/12*

U.S. Cl. 156—244.11 **10 Claims**

1. A method of making a composite electrode for a cell said composite electrode comprising a non-porous film or sheet the method comprising mixing a polymer consisting primarily of vinylidene fluoride with an insertion material in particulate form and an organic plasticiser, and extruding the mixture, the organic plasticiser being mixed with the polymer prior to completion of the extrusion, and the extrusion being performed at a temperature above the melting point of the polymer so as to form said non-porous film or sheet of the composite electrode.

US 6,409,868 B1

WINDOW FRAME AND METHOD OF FABRICATING SAME

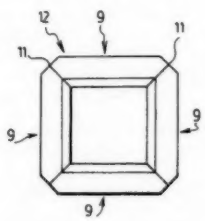
Ronald Fredrick Edger, Woodbrige, Canada, assignor to Royal Group Technologies Limited, Woodbridge, Canada

Filed Sep. 21, 2000, Appl. No. 666,077

Claims priority, application Canada, Sep. 21, 1999, 2282989

Int. Cl. E06B *1/26;* **B29C** *47/00*

U.S. Cl. 156—244.18 **4 Claims**



1. A method of fabricating a window frame of extrudable material, said frame having a body portion for insertion into a rectangular window opening and an integral nailing fin for circumscribing the window opening comprising extruding a length of profile having a cross sectional configuration corresponding to the desired window frame body portion and an integral nailing fin, the length of said profile being equal to the perimeter of the opening into which the body portion of said frame is to be inserted plus eight times a selected fraction of the width of the nailing fin, cutting said profile from opposite sides thereof at angles inclined at forty-five degrees (45°) to the length of said profile with the cuts meeting at a point in the nailing fin which is at said selected fraction of the width of the nailing fin to form four frame sections whose nailing fin ends are right angled triangles having their apexes at said point in said nailing fin, welding said four frame sections together to form the window frame and a circumscribing integral nailing fin.

US 6,409,869 B1

METHOD AND APPARATUS FOR FABRICATING CIRCUIT-FORMING-SUBSTRATE AND CIRCUIT-FORMING-SUBSTRATE MATERIAL

Shigeru Yamane; Toshihiro Nishii, both of Hirakata; Shinji Nakamura, Katano, and Masayuki Sakai, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

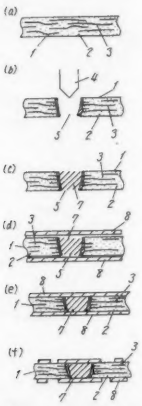
PCT No. PCT/JP98/05481, § 371 Date Sep. 15, 1999, § 102(e) Date Sep. 15, 1999, PCT Pub. No. WO99/30540, PCT Pub. Date Jun. 17, 1999

PCT Filed Dec. 4, 1998, Appl. No. 355,455

Claims priority, application Japan, Dec. 8, 1997, 9-336838

Int. Cl. B23K *26/00*

U.S. Cl. 156—252 **20 Claims**



1. A method for manufacturing a printed wiring board comprising the steps of:

forming a through-hole, or a non-through-hole, (a) in a board material of plate form or sheet form, that can be heat softened and melted, comprised mainly of either a thermoplastic resin or a thermosetting resin containing an uncured component, or a mixture of both, or (b) in a board material of plate form or sheet form, that can be heat softened and melted, made of woven, or nonwoven, fabric impregnated with a material comprised mainly of either said thermoplastic resin or thermosetting resin containing an uncured component, or a mixture of both, by irradiating said board material with an energy beam so that heat generated by the irradiation softens and melts an irradiated portion of said board material;

forming connection means in said through-hole, or non-through-hole, provided as a result of said hole-forming step, for electrically interconnecting one surface and the reverse surface of a board material; and

controlling humidity of said board material by dehumidifying said board material before said hole-forming step.

US 6,409,870 B1

DECORATIVE MOLDING/CASING

Timothy Duffney, Aitkin, Minn., assignor to 3D Design, Inc, Blaine, Minn.

Provisional application No. 60/117,403, filed on Jan. 27, 1999. This application Aug. 11, 1999, Appl. No. 372,692.

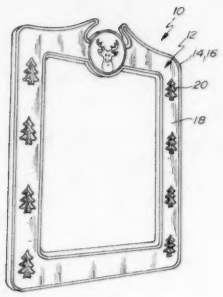
Int. Cl. B32B *31/18*

U.S. Cl. 156—256 **9 Claims**

1. A method for the manufacture of decorative molding/casing comprising:

(a) selecting a non-metallic frame having edges and a rear surface and then cutting grooves in the frame for creation of a front face section;

(b) creating a longitudinal groove in the rear face of the frame to establish a pair of support sections and a first interior surface;



(c) cutting any desired artistic design cutouts through the front face section through the use of a CNC machine for establishing at least one opening through the first interior surface and into the longitudinal groove;

(d) positioning a non-plastic colored filler material having a colored surface within the longitudinal groove whereby the colored surface is in contact with the first interior surface, the filler material not filling the cutouts; and

(e) securing the filler material within the longitudinal groove whereby the colored surface is visible through the cutouts traversing the front face section to highlight or accent the cutouts and the decorative molding/casing.

US 6,409,871 B1

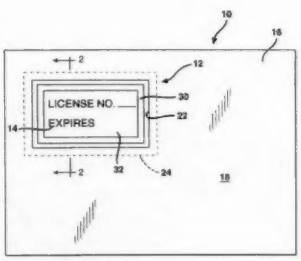
METHOD OF MAKING A BUSINESS FORM INCLUDING A LABEL

David E. Washburn; Hugh B. Skees, both of Dayton, and Bryce Waggoner, Monroe, all of Ohio, assignors to The Standard Register Company, Dayton, Ohio

Division of application No. 09/003,652, filed on Jan. 7, 1998, now Pat. No. 6,053,535, Provisional application No. 60/034,912, filed on Jan. 7, 1997. This application Feb. 28, 2000, Appl. No. 514,681.

Int. Cl. B32B *31/00*

U.S. Cl. 156—256 **4 Claims**



1. A method of making a business form including a label assembly, said method comprising:

a) providing a piece of carrier material having an upper surface and a lower surface, die cutting an opening therethrough, and removing the die cut portion of said material to form a carrier sheet;

b) adhesively mounting a patch of liner material to said lower surface of said carrier sheet such that said liner material extends over said die cut opening, said liner material having an upper surface facing said die cut opening and carrying a release coating on its upper surface;

c) adhesively mounting a transparent ply on said patch of liner material within said die cut opening; and

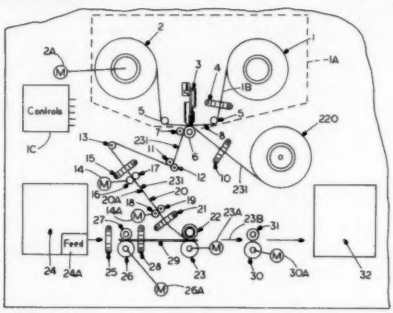
d) adhesively mounting a label ply on said transparent ply.

US 6,409,872 B1

IDENTIFICATION CARD PRINTER AND LAMINATOR

Kevin R. Campion; I. Tony Haugen, both of Minnetonka; Gary M. Klinefelter, Eden Prairie, and Jeffrey D. Upin, Edina, all of Minn., assignors to Fargo Electronics, Inc., Eden Prairie, Minn.

Filed Nov. 6, 1998, Appl. No. 188,396
Int. Cl. B32B *31/00*
U.S. Cl. 156—264 **11 Claims**



9. A method of providing a protective lamina on a substrate comprising providing a web of lamina material with a heat bondable layer on a reverse side thereof and with transverse weakened lines at spaced intervals, printing information on the reverse side of the web in selected locations between a pair of transverse weakened lines, driving the web with first and second spaced sets of drive rollers subsequent to printing, driving the first and second sets of rollers to move the web in a direction from the first set of drive rollers to the second set of drive rollers, selecting at least one of the steps of driving the first drive rollers at a reduced speed relative to the second set of drive rollers, and driving the second set of drive rollers at an increased speed relative to the first set of drive rollers to create a tension in the web for separating the selected locations at the transverse weakened lines into separate sheets of lamina, sensing a position of a leading edge of a separated sheet while held in the second set of rollers, driving the substrate with a third set of rollers toward a set of laminating rollers, sensing a position of a leading edge of the substrate while the substrate is held in the third set of rollers, using the sensed positions of the separated sheet of laminate for controlling the second and third sets of rollers to mate the separated sheet with a substrate and driving the second set of rollers and the third set of rollers to move the separate sheet and substrate directly to the laminating rollers.

US 6,409,873 B1

PROCESS AND APPARATUS FOR BONDING A PAIR OF DUCTS TOGETHER IN WHICH A REMOVABLE MEMBER IS USED TO HELP SUPPORT AND MAINTAIN ALIGNMENT BETWEEN THE DUCTS DURING BONDING

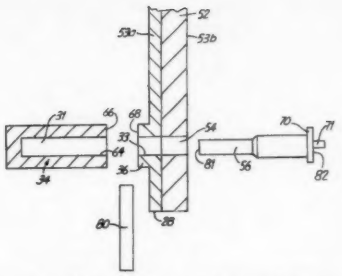
Michael R. Baxter, Chanhassen, Minn., assignor to FSI International, Inc., Chaska, Minn.

Filed Jan. 20, 1999, Appl. No. 233,873
Int. Cl. B29C *65/20;65/78*
U.S. Cl. 156—297 **7 Claims**

1. A method of encapsulating at least a portion of an article comprising a surface and a plurality of structures projecting from the surface, said method comprising the steps of:

(a) providing a first encapsulating component comprising a plurality of through ducts, said through ducts corresponding to at least a portion of said projecting structures such that said portion of the projecting structures fit through the through ducts when the first encapsulating component is positioned over the surface of the article;

(b) providing a second encapsulating component comprising a duct corresponding to a through duct of the first encapsulating component, said duct of the second encapsulating component defining at least a portion of an encapsulating chamber for receiving a projecting structure when the duct of the second encapsulating component is bonded to the corresponding duct of the first encapsulating component;



(c) rotatably supporting the first encapsulating component with a jig; inserting an alignment member through an aperture in the jig;

(d) bonding the duct of the second encapsulating component to the corresponding through duct of the first encapsulating component to form a pre-assembled encapsulating structure, said bonding occurring while the ducts are supported in alignment with each other on the alignment member;

(e) after bonding the ducts together, removing the alignment member from the pre-assembled encapsulating structure and the jig;

(f) optionally bonding one or more additional encapsulating components to the first encapsulating component; and

(g) fitting the pre-assembled encapsulating structure over the article in a manner such that a projecting structure is received in the encapsulating chamber.

US 6,409,874 B1

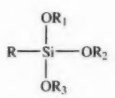
RUBBER TO METAL BONDING BY SILANE COUPLING AGENTS

Cornelis P. J. Van Der Aar, Roermond, Netherlands, and Wim J. Van Ooij, Fairfield, Ohio, assignors to Vernay Laboratories, Inc., Yellow Springs, Ohio, and University of Cincinnati, Cincinnati, Ohio

PCT No. PCT/US98/22576, § 371 Date Jun. 19, 2000, § 102(e) Date Jun. 19, 2000, PCT Pub. No. WO99/20705, PCT Pub. Date Apr. 29, 1999
Provisional application No. 60/062,738, filed on Oct. 23, 1997. This PCT application Oct. 23, 1998, Appl. No. 509,275.
Int. Cl. C09J *5/04*
U.S. Cl. 156—314 **35 Claims**

1. Method of adhering a metal substrate to a rubber substrate comprising contacting one of said substrates with an effective adhesive amount of an adhesive treatment comprising an organofunctional silane (I) and a non-organofunctional silane (II); said (I) and (II) being at least partially hydrolyzed, and placing said substrates together with said adhesive treatment interposed therebetween to effect said adhering, said organofunctional silane having the formula

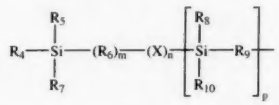
(I)



wherein R is a member selected from the group consisting of amino, C_1–C_6 alkylamino, vinyl, ureido, ureido substituted C_1–C_6 alkyl, epoxy, epoxy substituted C_1–C_6 alkyl, mercapto, mercapto substituted C_1–C_6 alkyl, cyanato, cyanato substituted C_1–C_6 alkyl, methacrylato, methacrylato substituted C_1–C_6 alkyl, and vinyl benzyl moieties; and R_1, R_2, and R_3 are the same or different and are

selected from C_1–C_6 alkyl and acetyl groups; and wherein said non-organofunctional silane is represented by the formula

(II)



wherein m is 0 or 1; n is 1; and p is 1; with R_4 selected from an aliphatic (saturated or unsaturated) group; aromatic group; or C_1–C_6 alkoxy; R_5, R_6, R_7, R_8, R_9, and R_{10} may be the same or different and are chosen from C_1–C_6 alkoxy, H or acetoxy; X, is alkylene, alkenylene, phenylene or amino.

US 6,409,875 B1

METATHESIS-ACTIVE ADHESION AGENTS AND METHODS FOR ENHANCING POLYMER ADHESION TO SURFACES

Michael A. Giardello, and Christopher M. Haar, both of Pasadena, Calif., assignors to Materia, Inc., Pasadena, Calif.

Provisional application No. 60/118,864, filed on Feb. 5, 1999. This application Feb. 4, 2000, Appl. No. 497,741.

Int. Cl. C09J *4/00;119/00*

U.S. Cl. 156—334 **22 Claims**

1. A method for adhering a polyolefin resin to a substrate surface comprising:

pretreating the substrate surface by applying an adhesive agent to the substrate surface, the adhesive agent comprising at least one C_3**14** C_{200} olefin compound having at least one metathesis active double bond, wherein the olefin is substituted or unsubstituted; and at least one compatibilizing functionality for interacting with the substrate surface; and applying the polyolefin resin to the pretreated surface in the presence of a metal carbene metathesis catalyst; wherein the adhesive agent does not contain any epoxy group.

US 6,409,876 B1

APPARATUS FOR ETCHING A WORKPIECE

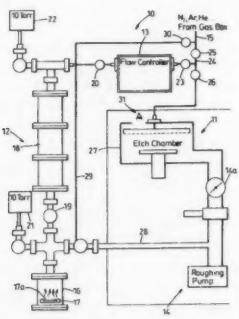
Andrew Duncan McQuarrie, San Jose, and Lee Campbell Boman, Belmont, both of Calif., assignors to Surface Technology Systems, plc, Newport, United Kingdom

Filed Apr. 24, 1998, Appl. No. 65,622

Claims priority, application United Kingdom, May 13, 1997, 9709659

Int. Cl. C23F *1/02*

U.S. Cl. 156—345 V **8 Claims**



1. An apparatus for etching a workpiece comprising:

an etch chamber;

a source chamber which is capable of containing a gas;

a first pressure source which is capable of providing a sublimation pressure of the gas within the source chamber;

a reservoir;

at least one first valve which is connected between the source chamber and the reservoir such that the source chamber is in fluid communication with the reservoir when the first valve is open;

a flow controller, having a gas input and a gas output, which is capable of controlling a flow rate of the gas which flows from the gas input to the gas output;

at least one second valve which is connected between the reservoir and the gas input of the flow controller such that the reservoir is in fluid communication with the flow controller when the second valve is open;

a second pressure source which is capable of maintaining the reservoir at approximately the sublimation pressure of the gas when the at least one second valve is closed; and

third valve which is connected between the gas output of the flow controller and the etch chamber such that the flow controller is in fluid communication with the etch chamber when the at least one third valve is open.

US 6,409,877 B1

APPARATUS AND METHOD FOR PLASMA ETCHING

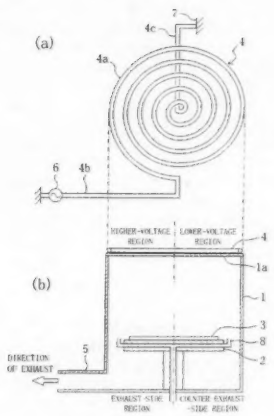
Mitsuhiro Ohkuni, Nara, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Division of application No. 09/201,826, filed on Dec. 1, 1998, now Pat. No. 6,274,502. This application Jun. 28, 2001, Appl. No. 892,723.

Claims priority, application Japan, Feb. 26, 1998, 10-044817; Apr. 3, 1998, 10-091132

Int. Cl. H05H *1/00*

U.S. Cl. 156—345 **8 Claims**



1. An apparatus for plasma etching, comprising:

a chamber;

a gas inlet port provided in said chamber to introduce etching gas into said chamber;

a gas outlet port provided in a side portion of said chamber to exhaust the gas from said chamber;

a sample stage provided within said chamber; and

a spiral coil disposed externally of said chamber and in opposing relationship with said sample stage to generate a plasma with a high-frequency induction field;

a higher-voltage region of said spiral coil and an exhaust-side region of said sample stage being positioned on the same side relative to a center axis of said chamber, and

said higher-voltage region of said spiral coil and said exhaust-side region of said sample stage overlapping each other at an angle in a range of 135–180°.

US 6,409,878 B1

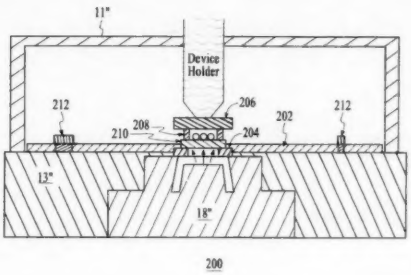
AUTOMATIC DECAPSULATION SYSTEM UTILIZING AN ACID RESISTANT, HIGH HEAT ENDURANCE AND FLEXIBLE SHEET COUPLED TO A RUBBER GASKET AND A METHOD OF USE

Xia Li, Fremont; Joseph Vu, San Jose; Mohammad Massoodi, Los Altos, and Jose Hulog, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of application No. 09/551,300, filed on Apr. 18, 2000. This application Oct. 5, 2000, Appl. No. 680,558.

Int. Cl. C23F *1/02*

U.S. Cl. 156—345.23 **19 Claims**



1. An automatic decapsulation system for a device comprising:

an etch plate;

an etch head for providing an etchant;

a sheet coupled to the etch plate for providing a gasket for the device and for aligning the gasket, wherein the sheet includes a top surface and a bottom surface, wherein a first trench is provided on the top surface for receiving the device, the first trench being substantially the same size as the device and wherein the sheet is acid resistant, high heat tolerant and flexible; and

a rubber gasket disposed between the sheet and the etch head for providing a seal between the device and the etch head.

US 6,409,879 B1

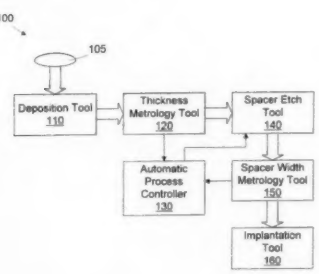
SYSTEM FOR CONTROLLING TRANSISTOR SPACER WIDTH

Anthony J. Toprac; John R. Behnke, and Matthew Purdy, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Austin, Tex.

Division of application No. 09/488,605, filed on Jan. 20, 2000. This application Jun. 23, 2000, Appl. No. 602,045.

Int. Cl. C23F *1/02;* **C23C** *16/00*

U.S. Cl. 156—345.24 **11 Claims**



1. A processing line for forming a spacer on a gate disposed on a substrate, comprising:

a deposition tool adapted to form an insulative layer over at least a portion of the substrate, the insulative layer covering the gate;

a thickness metrology tool adapted to measure the thickness of the insulative layer;

an automatic process controller adapted to determine an operating recipe parameter for a subsequent etch process to remove a portion of the insulative layer to form the spacer based on the measured thickness of the insulative layer; and

a spacer etch tool adapted to remove the portion of the insulative layer to define the spacer on the gate in accordance with the determined operating receipt parameter.

US 6,409,880 B2

APPARATUS AND PROCESS FOR REMOVING FINE IMPURITIES FROM A FIBROUS SUSPENSION

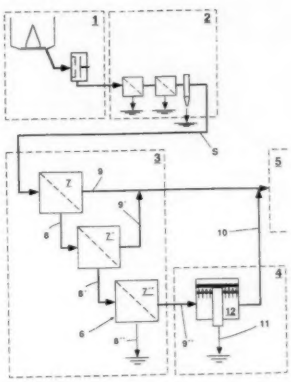
Martin Kemper, Weingarten, and Horst Wiese, Schongau, both of Germany, assignors to Voith Sulzer Papiertechnik Patent GmbH, Heidenheim, Germany

Continuation of application No. 09/236,235, filed on Jan. 22, 1999, now Pat. No. 6,277,239. This application Jun. 19, 2001, Appl. No. 883,380.

Claims priority, application Germany, Jan. 23, 1998, 198 02 494; Feb. 18, 1998, 198 06 732

Int. Cl. D21H *11/14;* **D21B** *1/08*

U.S. Cl. 162—4 **58 Claims**



1. A process for removing fine impurities from a fibrous suspension, comprising:

conveying the fibrous suspension to at least one sorting device;

separating the fibrous suspension using the at least one sorting device into an accepts portion and a rejects portion;

finishing at least some of the accepts portion leaving the at least one sorting device using a finishing device;

separating at least some portion of the rejects portion leaving the at least one sorting device using at least one last sorting device into an accepts portion and an rejects portion;

separating at least some portion of the accepts portion leaving the at least one last sorting device into an accepts portion and a rejects portion using a flotation device;

removing at least some of the fine impurities from the fibrous suspension; and

finishing at least some portion of the accepts portion leaving the flotation device using the finishing device.

US 6,409,881 B1

METAL-CROSSLINKABLE OXIDIZED CELLULOSE-CONTAINING FIBROUS MATERIALS AND PRODUCTS MADE THEREFROM

Thomas Jaschinski, Mannheim, Germany, assignor to SCA Hygiene Products GmbH, Mannheim, Germany

Filed Nov. 7, 2000, Appl. No. 706,764

Claims priority, application Germany, Nov. 8, 1999, 199 53 591

Int. Cl. D21H *11/20*

U.S. Cl. 162—9 25 Claims

1. A crosslinked cellulose-containing fibrous material, wherein hydroxy groups are oxidized at the C(6) of glucose units of the cellulose into aldehyde and/or carboxy groups crosslinked with a metal-containing crosslinking agent selected from transition metals of groups IVa, Va, VIa, VIIa and VIIIa, aluminum and zinc.

US 6,409,882 B1

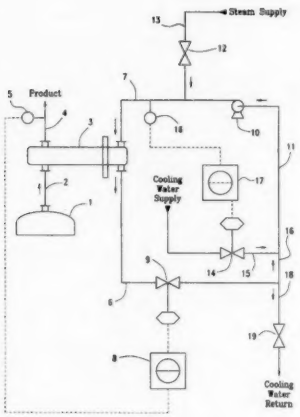
TALL OIL REFINING IMPROVEMENT

J. George Hayden, Isle of Palms, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 22, 1999, Appl. No. 427,127

Int. Cl. D21C *11/06*

U.S. Cl. 162—14 7 Claims



1. An improved process for refining crude tall oil produced by a wood pulping process employing anthraquinone as a pulping additive comprising fractionating the crude tall oil by using at least one heat exchanger and at least one refinery tower with an upper cooling zone to remove a pitch fraction therefrom and separating the remaining crude tall oil into a distilled tall oil fraction, tall oil rosin fraction, tall oil fatty acids fraction, and heads fraction whereby the heads fraction exiting the upper cooling zone forms a process stream directed through the heat exchanger and wherein the anthraquinone condenses in the cooling zone and solidifies in the heat exchanger and wherein water is used to cool the process stream, wherein the improvement comprises a method of reducing or eliminating said anthraquinone condensation and solidification in an indirect contact heat exchanger by controlling the temperature of the water circulating therethrough within a range from about 60° to about 210° F. and wherein the water cools the heads fraction by its circulation through one side of the heat exchanger via a cooling water loop to remove heat from the heads fraction which circulates through an opposing side of the heat exchanger wherein the temperature of the water in the cooling water loop is controlled by temperature sensors that turn on and off valves that, when turned on, permit injection of steam into the cooling water loop.

US 6,409,883 B1

METHODS OF MAKING FIBER BUNDLES AND FIBROUS STRUCTURES

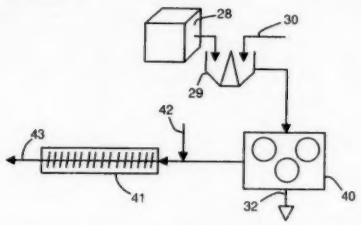
Robert J. Makolin; Emmanuelle C. Damay; Wendy L. Hamilton, all of Neenah; Patsy A. Hansen, Omro; William G. Reeves, Appleton; Heather A. Sorebo, Appleton; Fung-jou Chen, Appleton, and Jeffrey D. Lindsay, Appleton, all of Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Provisional application No. 60/129,746, filed on Apr. 16, 1999.

This application Apr. 12, 2000, Appl. No. 548,117.

Int. Cl. D21C *1/10*

U.S. Cl. 162—52 31 Claims



1. A method of making fibrous structures, the method comprising (a) forming an aqueous suspension of fibers having an inlet consistency of at least about 20 weight percent, (b) adding a debonding agent to the aqueous suspension and (c) subsequently passing the aqueous suspension through a disperser with an energy input of at least about 90 kW-h/T of dry fiber to form fibrous structures that are extruded from the disperser, wherein the fibrous structures exhibit a complex fluid retention capacity that is at least about 20 percent greater than the complex fluid retention capacity exhibited by an otherwise substantially similar fibrous structure that does not include a debonding agent.

US 6,409,884 B2

PRESS DEVICE HAVING AN EXTENDED NIP FOR PRESSING A RUNNING PAPER OR PAPERBOARD WEB

Erik Brox, Trollstigen 20, Sweden, assignor to Metso Paper Karlstad AB, Karlstad, Sweden

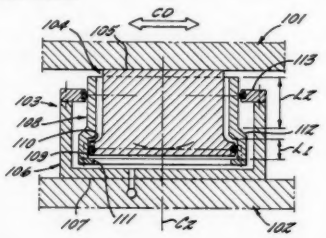
Provisional application No. 60/184,360, filed on Feb. 23, 2000.

This application Feb. 8, 2001, Appl. No. 779,781.

Claims priority, application Sweden, Feb. 18, 2000, 0000528-0

Int. Cl. D21F *3/00*

U.S. Cl. 162—358.3 9 Claims



1. A press device for pressing a traveling fibrous web, comprising:

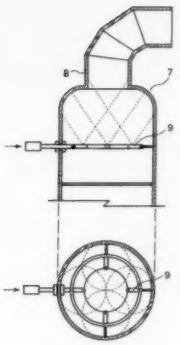
a press shoe extending in a cross-machine direction;

a counter member arranged so as to form an extended nip with the press shoe for passage of the web therethrough;

a carrier supporting the press shoe such that the press shoe is movable toward and away from the counter member;

a plurality of loading cylinders arranged between the carrier and the press shoe and spaced apart along the press shoe, the loading cylinders being operable by application of fluid pressure to urge the press shoe toward the counter member to

press the web in the nip, wherein at least some of the loading cylinders comprise a first cylinder member fixed on the press shoe and extending toward the carrier, a second cylinder member fixed on the carrier and extending toward the press shoe, and a generally tubular coupling member that slidably couples the first cylinder member with the second cylinder member, the coupling member having a first portion that slidably engages the first cylinder member and is displaceable over a first length of stroke L1 relative to the first cylinder member, the coupling member having a second portion that slidably engages the second cylinder member and is displaceable over a second length of stroke L2 relative to the second cylinder member, and wherein the first portion of the coupling member is closer to the carrier than is the second portion of the coupling member.



US 6,409,885 B1

PULP FORMING MACHINES

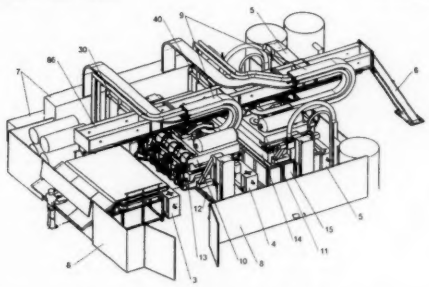
Benno Frank Smit; Brent Richard Mooney; Christopher Arthur Good, and Andre Brian Aish, all of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Filed Jun. 15, 2000, Appl. No. 594,928

Claims priority, application New Zealand, Jun. 15, 1999, 336291

Int. Cl. D21J *3/00*

U.S. Cl. 162—382 **19 Claims**



1. A pulp forming machine including a forming head comprising;

a platen having a,general plane,

a plurality of mould carriers,

mould carrier support means connecting each said mould carrier to said platen and allowing said mould carrier and said platen to transmit forces perpendicular to the general plane of said platen, while allowing movement and expansion of each said mould carrier in the general plane of said platen, and

mould carrier to mould carrier locating means to locate the mould carriers during a forming process to align moulds carried thereon with moulds of a co-operating platen.

US 6,409,886 B1

PROCESS FOR INHIBITING THE POLYMERIZATION OF EASILY-POLYMERIZABLE COMPOUNDS

Yukihiro Matsumoto, Kobe, and Takeshi Nishimura, Himeji, both of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka-fu, Japan

Filed Apr. 14, 2000, Appl. No. 549,531

Claims priority, application Japan, Apr. 16, 1999, 11-110043

Int. Cl. B01D *3/14;* **C07C** *51/44;57/07*

U.S. Cl. 203—8 **7 Claims**

1. A method for inhibiting polymerization of an easily polymerizable compound contained in a liquid which is being distilled in a distillation apparatus, which method comprises spraying the liquid containing said easily polymerizable compound against a constitutive member of said apparatus, which constitutive member is surrounded by a liquid of substantially the same composition as the liquid being sprayed, while contacting the sprayed liquid in said distillation apparatus with a gas containing molecular oxygen to inhibit polymerization of said easily polymerizable compound and wherein said sprayed liquid has a temperature equal to or lower than that of the liquid surrounding said constitutive member.

US 6,409,887 B1

POLYMERIZATION INHIBITOR

Anthony Pryce, Leeds, and Robert Charles Callin, Ben Rhydding, both of United Kingdom, assignors to AAH Marks and Company Limited, Wyke Bradford, United Kingdom

Continuation of application No. 09/230,013, filed as application No. PCT/GB97/01908, filed on Jul. 15, 1997, now abandoned. This application Apr. 13, 2001, Appl. No. 834,328.

Claims priority, application United Kingdom, Jul. 15, 1996, 9614854

Int. Cl. C07C *7/05;7/00*

U.S. Cl. 203—9 **7 Claims**

1. A monomer composition, stabilised against premature polymerisation, comprising:

a) an ethylenically unsaturated monomer or mixture of monomers polymerisable by free radical initiation, and

b) an effective amount, sufficient to inhibit premature polymerisation of component (a) of a mixture of:

i) 1 to 99% by weight, based on the total weight of components (i) and (ii) of a mixture of at least one aromatic amine and at least one organic acid in a molar ratio of 10:1 to 1:10, and

ii) 99 to 1% by weight based on the total weight of components (i) and (ii) of at least one stable radical compound, wherein the aromatic amine is selected from the group consisting of 3,5-ditertiarybutyl-4-oxy, N,N-dimethylbenzlamine; 1,4-phenylenediamine; and N,N'-bis-(1,4-dimethylpentyl)-1,4-phenylenediamine; wherein the organic acid is a carboxylic acid; and wherein the stable radical compound is a sterically hindered nitroxyl selected from 1-oxyl-2,2,6,6-tetramethylpiperidin-4-ol, 1-oxyl 2,2,6,6-tetramethylpiperidin-4-one, 1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl acetate, 1-oxyl 2,2,6,6-tetramethylpiperidin-4-yl sterate, 1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl benzoate, 1-oxyl 2,2,6,6-tetramethylpiperidin-4-yl 4-tert-butykbenzoate, bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl) succinate, bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl) sebacate, bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl benzoate) adipate, bis(1-oxyl-2,2,6,6-tetramethylpiperidin- 4--yl) n-butylmalonate, bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl) phthalate, bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl) isophthalate, bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)terephthalate, bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl) hexahydoterephthalate, N,N'-bis(1-oxyl-2,2,6,6-

tetramethylpiperidin-4-yl) adipamine, and N-(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl) caprolactam.

7. A process for inhibiting premature polymerisation of a vinyl aromatic or aliphatic compound during distillation, purification or storage, comprising the step of incorporating therein an effective amount, sufficient to prevent premature polymerisation during distillation, purification or storage of a mixture of

i) 1 to 99% by weight, based on the total weight of components (i) and (ii), of an admixture of at least one aromatic amine and at least on organic acid in a molar ratio of from 10:1 to 1:10 and

ii) 99 to 1% by weight, based on the total weight of components (i) and (ii), of at least one stable radical compound,

wherein the aromatic amine is selected from the group consisting of 3,5-ditertiarybutyl-4-oxy, N,N-dimethylbenzylamine; 1,4-phenylenediamine; and N,N'-bis-(1,4-dimethylpentyl)-1,4-phenylenediamine;

wherein the organic acid is a carboxylic acid; and

wherein the stable radical compound is a sterically hindered nitroxyl selected from 1-oxyl-2,2,6,6-tetramethylpiperidin-4-ol, 1-oxyl2,2,6,6-tetramethylpiperidin-4-one, 1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl acetate, 1-oxyl2,2,6,6-tetramethylpiperidin-4-yl stearate, 1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl benzoate, 1-oxyl2,2,6,6-tetramethylpiperidin-4-yl 4tert-butylbenzoate, bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4yl)succinate,bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl) sebacate, bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl benzoate) adipate, bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl) n-butylmalonate, bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl) phthalate, bis (1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)isophthalate, bis (1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl) terephthalate, bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl) hexahydoterephthalate, N,N'-bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl) adipamine, and N-(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl) caprolactam.

US 6,409,888 B1

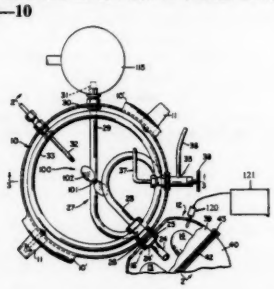
METHOD AND APPARATUS FOR WATER DEGASIFICATION AND DISTILLATION

John C. Ellis, Jr., Westbrook Farms, Rte. 209, Westbrookville, N.Y. 12785

Filed Mar. 16, 2000, Appl. No. 527,023

Int. Cl. B01D *3/02;3/42;19/00;* **C02F** *1/04;1/78*

U.S. Cl. 203—10 **4 Claims**



1. A method for producing a distilled water product which comprises:

providing a distillation apparatus comprising a water reservoir container having a water inlet and outlet thereto connected so as to create a reservoir of water therein and a boiler smaller than the reservoir container with an open connection between container and boiler for water flow to or from the boiler, a steam line overhead of the water level in the boiler leading to a condenser immersed in the reservoir, an outlet from said condenser to discharge condensate and an ozone generator in said boiler; and

maintaining a predetermined level of reservoir water by introducing feed water into and removing water from said container at a flow rate which maintains a temperature in the range of about 180°–190° F. in the reservoir and heating the water in said boiler to generate steam, the steam passing through ozone generated by said ozone generator and passing into said condenser to be condensed therein by heat exchange against the reservoir water whereby the reservoir water becomes heated and the heated reservoir water becomes devolatilized and deaerated prior to entering said boiler.

US 6,409,889 B2

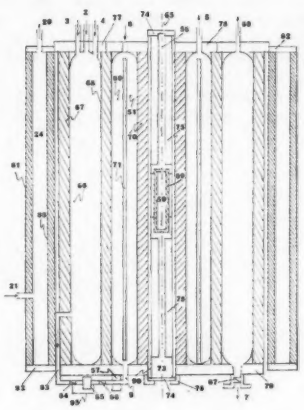
METHOD FOR THE REMOVAL AND RECOVERY OF INORGANIC POLLUTANTS FROM WASTE AQUEOUS SOLUTIONS AND WASTE PRIMARY AIR SOURCES

Mircea Faur; Maria Faur, and Horia M. Faur, all of North Olmsted, Ohio, assignors to Special Materials Research and Technology, Inc., North Olmsted, Ohio

Filed Apr. 13, 1999, Appl. No. 291,226

Int. Cl. B01D *53/00*

U.S. Cl. 204—157.44 **10 Claims**



1. A method for removal/recovery of inorganic pollutants from water, gases and suspension particles, said method comprising:

providing a reaction chamber, said chamber including a container of inherently radioactive materials;

introducing aqueous liquid media including media containing said pollutants into said reaction chamber;

applying pressure, heat, electric fields and ionizing radiation provided from said radioactive materials to said media to facilitate desired removal/recovery reactions; and

withdrawing said pollutants from said chamber.

US 6,409,890 B1

METHOD AND APPARATUS FOR FORMING A UNIFORM LAYER ON A WORKPIECE DURING SPUTTERING

Howard E. Grunes, Santa Cruz; Zheng Xu, Foster City; Praburam Gopalraja, Sunnyvale; John C. Forster, San Francisco; Ralf Hofmann, San Jose, and Anantha Subramani, San Jose, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

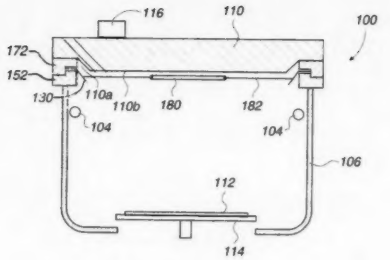
Filed Jul. 27, 1999, Appl. No. 362,917

Int. Cl. C23C *14/35;14/34*

U.S. Cl. 204—192.12 **48 Claims**

33. A method for sputtering a layer onto a workpiece in a chamber comprising:

positioning a body adjacent a central portion of a target and between said central portion of said target and said workpiece so that said central portion of said target is at least partially blocked from said workpiece by said body, said target having a flat sputtering surface, said body having a width smaller



than that of said target so that an outer portion of said flat sputtering surface is not blocked from said workpiece by said body;

wherein said body is positioned to act as a dark space shield so that sputtering from said central portion of said target is inhibited;

said body including a surface extending in a direction substantially parallel to said flat sputtering surface of said target;

transmitting energy to said chamber through a coil;

sputtering at least a portion of said outer portion of said flat sputtering surface of said target;

wherein said body inhibits material from said central portion of said target from being deposited on said workpiece;and

depositing a uniform layer of material from said target on said workpiece.

US 6,409,891 B1

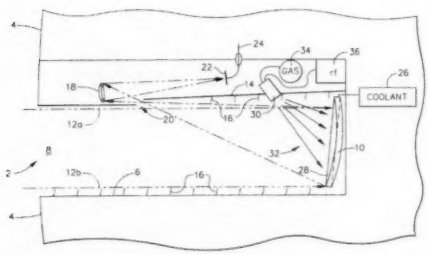
LOW ENERGY PLASMA CLEANING METHOD FOR CRYOFILMS

Barret Lippey, Gardena; Darrell A. Gleichauf, Redondo Beach, and Weldon S. Williamson, Malibu, all of Calif., assignors to Hughes Electronics Corporation, El Segundo, Calif.

Filed Apr. 29, 1994, Appl. No. 236,780

Int. Cl. C23C *14/34;* **B08B** *7/00*

U.S. Cl. 204—192.36 **7 Claims**



1. A method of removing a cryofilm and organic material mixture from a substrate, comprising:

sputtering said cryofilm and a portion of said organic material off of said substrate with a sputtering plasma having an average ion energy of not more than about 30 eV, and

removing the remainder of said organic material from said substrate by reacting it with a reactive plasma having an average ion energy of not more than about 30 eV, wherein said sputtering and reactive plasmas comprise different plasmas.

US 6,409,892 B1

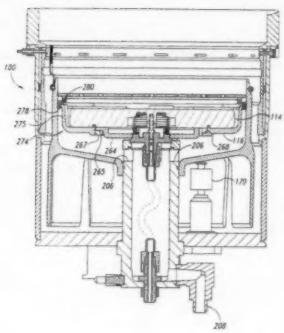
REACTOR VESSEL HAVING IMPROVED CUP, ANODE, AND CONDUCTOR ASSEMBLY

Daniel J. Woodruff, and Kyle M. Hanson, both of Kalispell, Mont., assignors to Semitool, Inc., Kalispell, Mont.

Division of application No. 09/112,300, filed on Jul. 9, 1998, now Pat. No. 6,228,232. This application Aug. 30, 1999, Appl. No. 385,342.

Int. Cl. C25B *9/00;* **C25C** *7/00;* **C25D** *17/00*

U.S. Cl. 204—242 **11 Claims**



1. A reactor vessel for electroplating a microelectronic workpiece, comprising:

a reservoir container including a base plate and a surrounding container side wall upstanding from said base plate;

a cup arranged above said base plate, said cup having a bottom wall and a surrounding cup side wall upstanding from said bottom wall, said cup sidewall defining a level for a process fluid within said cup during operation;

an anode arranged within said cup below said level; and

an anode support arranged beneath said anode and supported from said base plate, the anode being removably attached to the anode support, the anode support having a first portion, a second portion removably attached to the anode, and a spacer removably positioned between the first and second portions, the spacer having a thickness selected to position the anode at one of a plurality of selectable distances from said level defined by the cup sidewall.

US 6,409,893 B1

PHOTOELECTROCHEMICAL CELL

Jurgen Holzbock, Am Graffweg 1, D-45886 Gelsenkirchen; Olaf Knebel, Wilhelmshöhe 1, D-44388 Dortmund, and Ingo Uhlendorf, Paulinenstrasse 13, D-45881 Gelsenkirchen, all of Germany

Filed Jun. 29, 2000, Appl. No. 606,000

Claims priority, application Germany, Jun. 29, 1999, 199 29 509

Int. Cl. C25B *9/00*

U.S. Cl. 204—242 **2 Claims**

1. A photoelectrochemical cell with one work electrode and one counter electrode that is arranged opposite the work electrode,

whose electrochemically active surfaces are facing each other and with an electrolyte being provided for between the surfaces which contains a redox system, with the surface of the counter electrode being catalytically active,

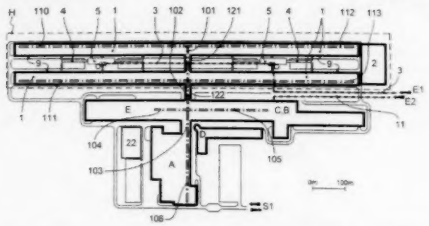
characterized by the fact that the catalytically active surface including a polyethylenedioxythiophene of the counter electrode containing at least one polymer based on polyaniline, polypyrrole or polythiopene.

US 6,409,894 B1

LAY-OUT OF INSTALLATIONS IN AN ELECTROLYSIS PLANT FOR THE PRODUCTION OF ALUMINUM

Jean-Pierre Boucard, Biviers, France, assignor to Aluminium Pechiney, Paris Cedex 16, France

Filed Apr. 25, 2000, Appl. No. 556,773
Claims priority, application France, Mar. 24, 2000, 00 03813
Int. Cl. C25C *3/00*
U.S. Cl. 204—244 **22 Claims**



1. An arrangement of an electrolysis plant for production of aluminum comprising:

a. operational zones including at least one liquid aluminum production zone containing electrolysis pots arranged in lines, installations for the supply and recycling of anode assemblies, installations for the supply and recycling of electrolytic baths, and installations for the processing of liquid aluminum,

b. operational support zones comprising:

(i) a first zone grouping together the installations for the supply and recycling of anode assemblies,

(ii) a second zone grouping together the installations for the supply and recycling of electrolytic baths, and

(iii) a third zone grouping together the liquid aluminum processing installations,

c. transport means to convey heavy intermediate products between said operational zones, according to determined intermediate flows, said intermediate products including liquid aluminum, anode assemblies and solid electrolytic baths, and

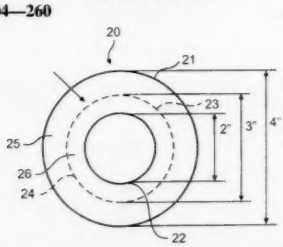
d. at least one transit zone located between said liquid aluminum production zone and at least one of said operational support zones, said transit zone being reserved for at least part of said transport means for the heavy intermediate products.

US 6,409,895 B1

ELECTROLYTIC CELL AND METHOD FOR ELECTROLYSIS

Gian Piero Ponzano, Genoa, Italy, assignor to Alcavis International, Inc., Gaithersburg, Md.

Filed Apr. 19, 2000, Appl. No. 552,645
Int. Cl. C25B *9/00*
U.S. Cl. 204—260 **25 Claims**



1. A cell for electrolysis of brine to produce sodium hypochlorite and active chlorine, comprising:

a hollow cylindrical cathode;

a hollow cylindrical anode disposed coaxially within the cathode to define an annular space containing particulate carbon, for passage of said brine during electrolysis;

a housing enclosing said cathode and anode;

a membrane disposed between the anode and cathode within said annular space to define an anodic chamber and a cathodic chamber; and

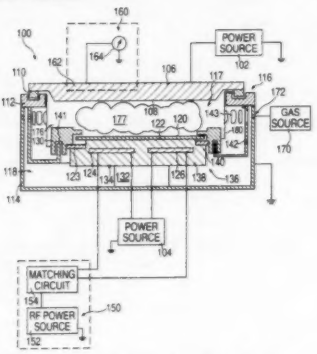
inlets for introduction of said brine into the annular space and outlets for withdrawing electrolysis products including said sodium hypochlorite and active chlorine.

US 6,409,896 B2

METHOD AND APPARATUS FOR SEMICONDUCTOR WAFER PROCESS MONITORING

Steve Crocker, Sunnyvale, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed Dec. 1, 1999, Appl. No. 452,750
Int. Cl. C23C *14/00;16/00*
U.S. Cl. 204—298.03 **21 Claims**



1. Apparatus for detecting a plasma in a plasma processing chamber having a chamber sidewall, said apparatus comprising:

an electrically floating deposition target plate disposed above said sidewall, said electrically floating deposition target plate changing in electrical potential when exposed to said plasma; and

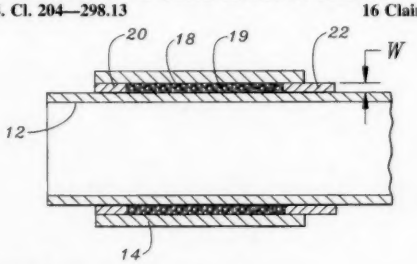
a measuring device coupled to said electrically floating deposition target plate for detecting the change in electrical potential on the target plate indicative of a presence of a plasma formation during a cleaning cycle.

US 6,409,897 B1

ROTATABLE SPUTTER TARGET

Larry S. Wingo, Rhome, Tex., assignor to Poco Graphite, Inc., Decatur, Tex.

Filed Sep. 20, 2000, Appl. No. 666,977
Int. Cl. C23C *14/34;* **B29D** *22/00;23/00;* **B32B** *1/08*
U.S. Cl. 204—298.13 **16 Claims**



1. A sputter target comprising:

(a) a tube;

(b) a sleeve comprising a sputtering material, said sleeve having an inside diameter greater than the outside diameter of said tube and surrounding said tube in such a manner as to form an

annular space between the outside surface of said tube and the inside surface of said sleeve;

(c) a thermally conductive material at least partially occupying said annular space,

(d) wherein said thermally conductive material comprises a particulate material.

US 6,409,898 B1

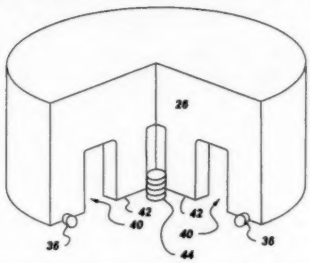
COOLING SYSTEM FOR CATHODIC ARC CATHODES

Scott Andrew Weaver, Ballston Lake; Don Mark Lipkin, and Reed Roeder Corderman, both of Niskayuna, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 28, 2001, Appl. No. 681,386

Int. Cl. C25B *11/02;* **C23C** *14/34*

U.S. Cl. 204—298.41 **25 Claims**



13. An apparatus for cathodic arc coating, said apparatus comprising:

(a) a vacuum chamber which includes an anode;

(b) a power supply;

(c) a cathode target assembly located within said vacuum chamber and connected to said power supply, said cathode target assembly comprising a cathode target having a channeled back surface for improving heat transfer from said cathode target and a conductor segment connecting said cathode target to the power supply of said cathodic arc coating apparatus; and

(d) a cooling block in contact with said cathode target.

US 6,409,899 B1

GAS SENSOR ELEMENT WITH LEAD-PROOF EFFECT

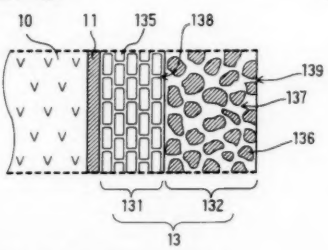
Motoaki Satou, Aichi-gun; Yasumichi Hotta, Mie-gun; Namitsugu Fujii, Yokkaichi, and Hiromi Sano, Nagoya, all of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Feb. 23, 2000, Appl. No. 511,079

Claims priority, application Japan, Feb. 25, 1999, 11-48467; Dec. 7, 1999, 11-347682

Int. Cl. G01N *27/407*

U.S. Cl. 204—429 **5 Claims**



1. A gas sensor element comprising:

a solid electrolyte body;

a reference gas side electrode disposed on a first surface of the solid electrolyte body to contact a reference gas;

a measurement gas side electrode disposed on a second surface of a solid electrolyte body to contact a measurement gas; and

a porous protective layer covering a surface of the measurement gas side electrode and including a component which reacts with lead contained in the measurement gas;

wherein the component is selected from a group consisting of WO_3, MoO_3, Fe_2O_3, and Nb_2O_5.

US 6,409,900 B1

CONTROLLED FLUID TRANSPORT IN MICROFABRICATED POLYMERIC SUBSTRATES

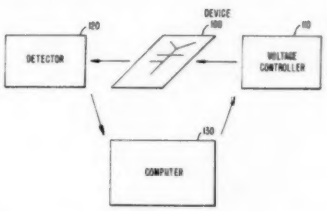
John Wallace Parce, Palo Alto; Michael R. Knapp, Aptos; Calvin Y. H. Chow, Portola Valley, and Luc Bousse, Menlo Park, all of Calif., assignors to Caliper Technologies Corp., Mountain View, Calif.

Continuation of application No. 09/179,242, filed on Oct. 26, 1998, now Pat. No. 6,156,181, which is a continuation of application No. 08/843,212, filed on Apr. 14, 1997, now Pat. No. 5,885,470, Provisional application No. 60/015,498, filed on Apr. 16, 1996. This application Sep. 19, 2000, Appl. No. 664,847.

This patent is subject to a terminal disclaimer.

Int. Cl. B44C *1/22*

U.S. Cl. 204—450 **57 Claims**



1. A microfluidic device, comprising: a body structure comprising at least one polymeric material, the body structure having at least a first microchannel disposed therein, which at least first microchannel comprises at least a first fluidic material, which first fluidic material is electroosmotically flowed through the at least first microchannel at a mobility of at least about 1×10^{-5} $cm^2V^{-1}s^{-1}$.

US 6,409,901 B1

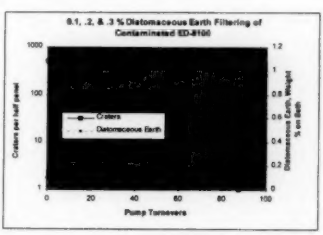
METHOD AND DEVICE FOR TREATING CONTAMINATED COATING COMPOSITIONS

Keith S. Ritter, Allison Park; Michael G. Sandala, Pittsburgh, and Ellor J. Van Buskirk, Wexford, all of Pa., assignors to PPG Industries Ohio, Inc., Cleveland, Ohio

Filed May 1, 2000, Appl. No. 561,949

Int. Cl. C25D *13/00*

U.S. Cl. 204—480 **14 Claims**



1. A method of treating a liquid in an electrodeposition coating process, comprising the steps of:

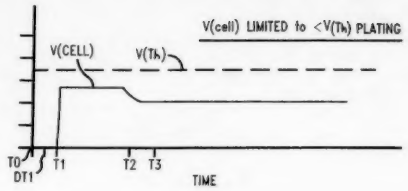
providing a tank having a liquid comprising a contaminant and an electrocoating composition comprising a resinous material, wherein the tank is a coating tank and/or a rinse tank;

placing a filtering device comprising diatomaceous earth in flow communication with the tank;

directing the liquid from the tank through the filtering device to separate at least a portion of the contaminant from the liquid;

directing at least a portion of the liquid from the filtering device back into the tank; and

electrodepositing a film of the electrocoating composition onto an electroconductive substrate.



US 6,409,902 B1

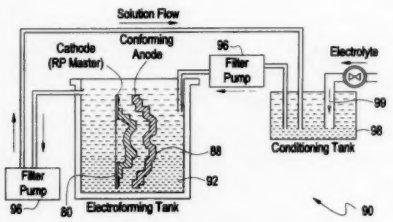
RAPID PRODUCTION OF ENGINEERING TOOLS AND HOLLOW BODIES BY INTEGRATION OF ELECTROFORMING AND SOLID FREEFORM FABRICATION

Bo Yang, Kearny, and Ming C. Leu, Pine Brook, both of N.J., assignors to New Jersey Institute of Technology, Newark, N.J.

Filed Aug. 6, 1999, Appl. No. 370,649

Int. Cl. C25D *1/10;1/00*

U.S. Cl. 205—70 **12 Claims**



1. A method for producing objects by integration of an electroforming deposition and a solid freeform design and fabrication machine consisting of the steps of:

providing a predetermined shape of an object to be produced;

generating a rapid prototyping master having a shape corresponding to said predetermined shape of said object and defining a generally hollow interior;

generating an anode by computer aided design, said anode having an offset distance from and conforming to said shape of said rapid prototyping master;

electroforming a layer of metal upon said rapid prototyping master to form a cathode shell on said rapid prototyping master;

removing said rapid prototyping master from said cathode shell, wherein a shape of said cathode shell conforms to said predetermined shape of said object.

US 6,409,903 B1

MULTI-STEP POTENTIOSTATIC/GALVANOSTATIC PLATING CONTROL

Dean S. Chung, Essex Junction; Josef W. Korejwa, Charlotte, and Erick G. Walton, Underhill, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1999, Appl. No. 469,120

Int. Cl. C25D *5/00;5/18;7/12;17/00*

U.S. Cl. 205—96 **18 Claims**

1. A multistep electroplating process for electroplating a substrate containing a seed layer thereon with copper or other metal comprising the steps of:

inserting the substrate having the seed layer thereon to initiate metal plating into an electroplating apparatus comprising a metal plating solution, an anode and multiple cathode electrical perimeter contacts to the seed layer;

exposing the seed layer, anode and the perimeter contacts to the metal plating solution;

plating onto the seed layer and substrate by applying to the anode and cathode perimeter contacts for a first time period a voltage below a predetermined threshold voltage which was empirically determined to cause burn-through of the seed layer; and

continuing the plating onto the plated substrate by applying after the first time period a current to the anode and cathode perimeter contacts for a second time period the current producing a voltage below the predetermined threshold voltage.

US 6,409,904 B1

METHOD AND APPARATUS FOR DEPOSITING AND CONTROLLING THE TEXTURE OF A THIN FILM

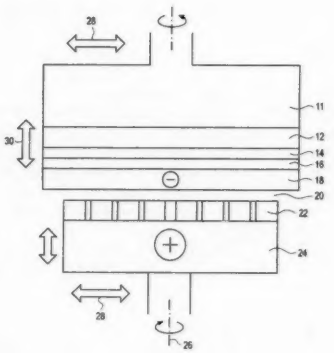
Cyprian Emeka Uzoh, Milpitas, and Homayoun Talieh, San Jose, both of Calif., assignors to Nutool, Inc., Milpitas, Calif.

Continuation-in-part of application No. 09/201,929, filed on Dec. 1, 1998, now Pat. No. 6,176,992, which is a continuation-in-part of application No. 09/285,621, filed on Apr. 3, 1999, now Pat. No. 6,328,872. This application Aug. 13, 1999, Appl. No. 373,681.

This patent is subject to a terminal disclaimer.

Int. Cl. C25D *5/52;5/50;5/00*

U.S. Cl. 205—137 **30 Claims**



1. A method for altering the texture of a top portion of a conductive layer formed on a substrate, the method comprising the steps of:

(1) plating the conductive layer on the substrate by applying a plating solution thereto using an anode and a pad disposed in proximity to the substrate, when the anode and the substrate are energized with electric power; and

(2) altering the texture of the top portion of the conductive layer during a period when the pad makes contact with the top portion of the conductive layer, when the anode and the substrate are de-energized.

US 6,409,905 B1

METHOD OF AND ELECTROLYTE FOR ANODIZING ALUMINUM SUBSTRATES FOR SOLID CAPACITORS

Brian J. Melody; John T. Kinard, both of Greer; Philip M. Lessner, Simpsonville; Albert K. Harrington, Mauldin, and David A. Wheeler, Williamston, all of S.C., assignors to Kemet Electronics Corporation, Greenville, S.C.

Filed Nov. 13, 2000, Appl. No. 709,742

Int. Cl. C25D *11/06*

U.S. Cl. 205—234 **20 Claims**

1. A method of anodizing comprising suspending at least one aluminum substrate into an electrolyte solution and applying an anodizing current to the electrolyte solution, wherein the electrolyte solution comprises from about 5 to about 99.5 wt % glycerine, about 0.05 to about 5.0 wt. % of at least one soluble orthophosphate salt selected from the group consisting of ammonium phosphates, amine phosphates, or mixtures thereof, and water.

US 6,409,906 B1

ELECTROPLATING SOLUTION FOR PLATING ANTIMONY AND ANTIMONY ALLOY COATINGS

Chalo Matta Aoun, Carrollton, Tex., assignor to Frank C. Danigan, Dallas, Tex.

Division of application No. 09/347,943, filed on Jul. 6, 1999. This application Oct. 25, 2000, Appl. No. 696,149.

Int. Cl. C25D *3/02;3/56*

U.S. Cl. 205—239 **20 Claims**

1. An acidic aqueous electroplating solution for electroplating a metallic coating onto an electrically conductive substrate, the coating comprising at least about 75 weight percent antimony, the solution containing from about 0.5 to about 120 g/l of antimony, an acid selected from the group consisting of hydrochloric acid, hydrofluoric acid, hydrobromic acid, hydroiodic acid, fluoboric acid, phosphoric acid, sulfamic acid in an amount at least sufficient to maintain the pH of the solution below about 6.0, a complexer selected from the group consisting of pyridine and pyridine derivatives, glycine, valine, cysterine, urea, and ammonium salts and a wetter selected from the group consisting of ethoxylated alcohols, alkanolamines, alkanolamides, alcohol sulfates, ethoxylated alkyl phenols, ethoxylated fatty acids, alkyl sulfonates, alkylsulfosuccinates, perfluoroalkyl sulfonates, fatty acid alcohol ethoxylates and propylene oxide/ethylene oxide block copolymers.

US 6,409,907 B1

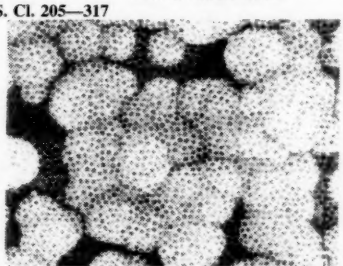
ELECTROCHEMICAL PROCESS FOR FABRICATING ARTICLE EXHIBITING SUBSTANTIAL THREE-DIMENSIONAL ORDER AND RESULTANT ARTICLE

Paul VanNest Braun, Berkeley Heights; Michael Louis Steigerwald, Martinsville, and Pierre Wiltzius, Millington, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Feb. 11, 1999, Appl. No. 248,858

Int. Cl. C25D *11/00*

U.S. Cl. 205—317 **13 Claims**



1. A process for fabricating an article comprising a material exhibiting substantial periodicity, the process comprising the steps of:

providing a template comprising a colloidal crystal;

electrochemically depositing a lattice material onto the colloidal crystal; and

removing the colloidal crystal to form the material exhibiting substantial periodicity.

US 6,409,908 B1

ELECTROCHEMICAL PRODUCTION OF ALKALI METAL FROM AN ALKALI METAL AMALGAM

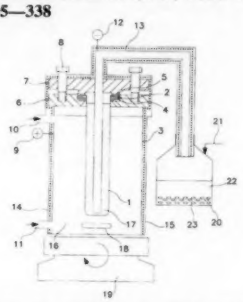
Günther Huber, Ludwigshafen; Hermann Pütter, Neustadt; Kerstin Schierle-Arndt, Mannheim; Dieter Schläfer, Ludwigshafen; Josef Guth, Freinsheim; Bernd Schube, Mutterstadt, and Diethard Lenz, Bobenheim-Roxheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Dec. 13, 1999, Appl. No. 459,726

Claims priority, application Germany, Dec. 22, 1998, 198 59 563

Int. Cl. C25B *1/00;3/00;* **C25C** *1/00;3/00*

U.S. Cl. 205—338 **6 Claims**



1. A process for producing an alkali metal from alkali metal amalgam by electrolysis utilizing an anode containing alkali metal amalgam, a solid electrolyte conducting alkali metal ions and a liquid alkali metal as cathode, wherein the alkali metal amalgam as anode is kept in motion under atmospheric pressure or slightly superatmospheric pressure by stirring and/or by means of a pump driven in an internal circuit thereby producing an alkali metal.

US 6,409,909 B1

MODULAR SENSOR SYSTEM FOR THE INDUSTRIAL PROCESS MEASUREMENT TECHNIQUE

Ursula Spichiger-Keller, Au, and Jürg Müller, Olten, both of Switzerland, assignors to Eidgenossische Technische Hochschule Zurich, Zurich, Switzerland

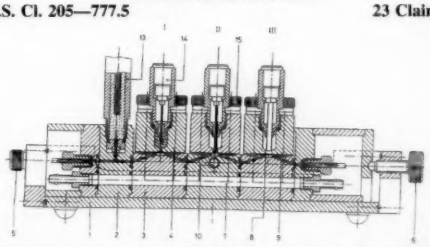
PCT No. PCT/IB98/00044, § 371 Date Aug. 16, 1999, § 102(e) Date Aug. 16, 1999, PCT Pub. No. WO98/30892, PCT Pub. Date Jul. 16, 1998

PCT Filed Jan. 13, 1998, Appl. No. 341,481

Claims priority, application Switzerland, Jan. 14, 1997, 64/97

Int. Cl. G01N *27/26;21/00*

U.S. Cl. 205—777.5 **23 Claims**



1. Modular system for the continuous reagent-less determination of at least one substance, said modular system comprising at least

two measuring modules of the same or different modular type for the simultaneous yield of at least two items of information during flow-through of said substance, each module including at least one exchangeable selective layered structure and a transducing device cooperating with the layered structure to provide a selective recognition step and allow a continuous measuring of the respective item of information, said selective layered structure being interchangeably sealed in said module by an elasticity of the layered structure, each said module containing a channel for the flow-through of said substance, said channel being in direct communication with said selective layered structure of said module.

US 6,409,910 B1

PROCESS FOR TREATING GAS OR LIQUIDS THAT ARE OBTAINED FROM CATALYTIC REFORMING

Christophe Nedez, Salindres, France, assignor to Institut Francais du Petrole, France

Filed Jun. 25, 1999, Appl. No. 344,361

Claims priority, application France, Jun. 25, 1998, 98 08090

Int. Cl. C10G *67/06*

U.S. Cl. 208—99 **20 Claims**

1. A process for eliminating halogenated compounds contained in a gas or a liquid, whereby said gas or liquid comprises hydrogen and unsaturated hydrocarbons, comprising successively bringing the gas or liquid into contact with:

at least one hydrogenation catalyst, then

at least one adsorbent of halogenated compounds having an alumina base.

US 6,409,911 B1

SILICOALUMINOPHOSPHATES HAVING AN AEL STRUCTURE AND THEIR USE AS FCC CATALYSTS

Karl G. Strohmaier, Port Murray; David E. W. Vaughan, Flemington, both of N.J.; Tan Jen Chen; Philip A. Ruziska, both of Kingwood, Tex.; Brian Erik Henry, Baton Rouge, La.; Gordon F. Stuntz, Baton Rouge, La., and Stephen M. Davis, Baton Rouge, La., assignors to ExxonMobil Chemical Patents, Inc., Houston, Tex.

Division of application No. 09/315,416, filed on May 20, 1999, now Pat. No. 6,294,493, Provisional application No. 60/086,681, filed on May 26, 1998. This application Sep. 13, 2000, Appl. No. 660,695.

Int. Cl. C01G *11/00;11/02;11/04*

U.S. Cl. 208—118 **20 Claims**

1. A fluidized catalytic cracking method comprising injecting a feed into an FCC riser reactor having a reaction zone and catalytically cracking the feed in the reaction zone under catalytic cracking conditions in the presence of a catalytically effective amount of a cracking catalyst in order to form a cracked product, the cracking catalyst containing a major amount of a large-pore zeolite catalyst and a minor amount of a molecular sieve catalyst with a framework tetrahedra of silicon, aluminum, and phosphorus, the molecular sieve having a total silicon amount ranging from above about 4 molar percent to about 20 molar percent; having a total aluminum amount ranging from about 40 molar percent to about 55 molar percent; and having a total phosphorus amount ranging from about 30 molar percent to about 50 molar percent, the molar percents being based on the total amount of aluminum, phosphorus, and silicon present in the composition; having the topology AEL; and being isostructural with conventional SAPO11, wherein

(a) the silicon present in the molecular sieve and the conventional SAPO- 11 is distributed among silicon sites in the framework tetrahedra, each site having a first, a second, a third, and a fourth nearest neighbor position, and each nearest neighbor position being independently occupied by one atom selected from silicon, and aluminum, and

(b) the molecular sieve has a substantially smaller number of silicon sites having silicon atoms among all four nearest neighbor positions than the conventional SAPO-11 with the total silicon amount.

US 6,409,912 B1

INTEGRATION OF SOLVENT DEASPHALTING, GASIFICATION, AND HYDROTREATING

Paul S. Wallace, Katy, and Kay Anderson Johnson, Missouri City, both of Tex., assignors to Texaco, Inc., White Plains, N.Y.

Provisional application No. 60/115,418, filed on Jan. 11, 1999. This application Jan. 11, 2000, Appl. No. 476,965.

Int. Cl. C10G *45/00*

U.S. Cl. 208—209 **14 Claims**

1. A process of hydrotreating a hydrocarbon stream in a hydrotreater and then recovering the products, said process comprising:

a) introducing a hydrotreater gas and a hydrocarbon stream to a hydrotreater;

b) reacting a portion of the hydrotreater gas with the hydrocarbon stream in the hydrotreater, thereby forming a reaction mixture;

c) removing the reaction mixture from the hydrotreater;

d) stripping the reaction mixture with steam or nitrogen; and

e) separating the reaction mixture into a gaseous and a fluid phase.

US 6,409,913 B1

NAPHTHA DESULFURIZATION WITH REDUCED MERCAPTAN FORMATION

Janet R. Clark; Michele S. Touvelle; Thomas R. Halbert, all of Baton Rouge, La.; Bruce R. Cook, Stewartsville, N.J.; Garland B. Brignac, Clinton, and William C. Baird, Jr., Baton Rouge, both of La., assignors to ExxonMobil Research and Engineering Company, Annandale, N.J.

Continuation-in-part of application No. 08/583,725, filed on Feb. 2, 1996. This application Dec. 3, 1999, Appl. No. 454,371.

Int. Cl. C10G *25/00*

U.S. Cl. 208—213 **28 Claims**

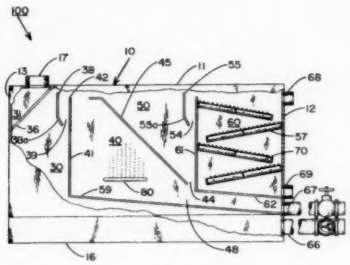
1. A process for desulfurizing a sulfur and olefin-containing naphtha feed while inhibiting mercaptan formation, comprising reacting said feed with hydrogen, in the presence of a hydrodesulfurizing catalyst where in said catalyst comprises at least one Group VIII catalytic metal component and a catalyst support component and at least one Group VI Catalytic metal at reaction conditions including a temperature of from 290–425° C., a pressure of from 60–150 psig, and a hydrogen treat gas ratio of from 2000–4000 scf/b.

US 6,409,914 B1

WASTE TREATMENT UNIT

K. Eugen Keppeler, Cicero, and Richard Brian Dixon, East Syracuse, both of N.Y., assignors to Crystal River Industries, Inc., Kirkville, N.Y.

Filed Aug. 22, 2000, Appl. No. 643,303
Int. Cl. B01D *33/70*
U.S. Cl. 210—151 8 Claims



1. Wastewater pretreatment tank assembly to be interposed between a wastewater source and a sewer system that leads to a downstream sewage treatment facility, the tank assembly comprising

a shell having a bottom, a top, sides and first and second end walls,

said shell having first and second weirs interposed between said first and second end walls,

said shell having a divider wall interposed between said top and bottom,

said first end wall, said first weir and said divider wall defining a first chamber between said shell sides,

means coupled to said wastewater source for introducing wastewater into said first chamber so that solids in said wastewater settle to the bottom in said first chamber and undergo digestion,

said divider wall and a baffle plate defining a second activated sludge chamber, and including means for further removing suspended solids from the wastewater that has spilled from said first chamber over said divider wall into said second chamber,

said baffle plate, said second weir and a second divider wall defining a settling chamber where said wastewater from said second chamber enters so that solids in said wastewater settle to the bottom,

said settling chamber including means for recycling said solids into said second chamber to enhance activated sludge processing,

said second divider wall and said second end wall defining a fourth biological filtration chamber and including means for biologically removing ammonia and BOD from said wastewater that has spilled into said fourth chamber from said third chamber,

a drain overflow for directing treated wastewater into said sewer system and a port open to said fourth chamber through which the treated wastewater is passed into said sewer system, and

a sludge evacuation conduit having an inlet end in communication with the bottom of said first chamber, an outlet end connectable to said sewer system, and a valve interposed in said sludge evacuation conduit and connectable for normally retaining in said first chamber wastewater and sludge up to the level of said first weir,

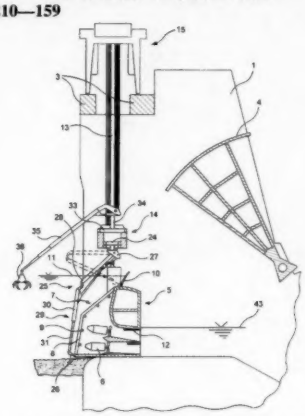
said valve being selectively operable for permitting discharge of the digested sludge from said first chamber into the sewer system.

US 6,409,915 B1

RAKE CLEANING ARRANGEMENT

Karl Heinz Rusch, Dornbirn, Austria, assignor to Hans Kuenz Gesellschaft m.b.H., Hard, Austria

Filed Apr. 27, 2001, Appl. No. 844,614
Claims priority, application Austria, Apr. 28, 2000, 749/00
Int. Cl. E02B *5/08*; B01D *29/64*
U.S. Cl. 210—159 19 Claims



1. A rake cleaning arrangement for a trashrack situated in front of the intake opening of a turbine arrangement, wherein the turbine arrangement is arranged in a weir opening delimited at its sides by two pillars and these pillars delimiting the weir opening are spanned by at least one gangway forming a service platform; the rake cleaning arrangement comprising:

a bridge forming a service platform which can be lowered into the weir opening by a crane arranged on top of or on the gangway; and

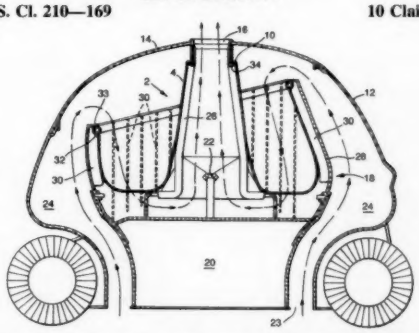
a skimming arrangement for removing flotsam from the trashrack by which a tool can travel along the vertical extent of the trashrack and which is arranged on the bridge, wherein the tool can travel along the vertical extent of the trashrack by the skimming arrangement when the bridge is stationary.

US 6,409,916 B1

FILTER ELEMENT FOR POOL-CLEANING DEVICE

Shimon Zelas, Kibbutz Yizreel, and Freddy Derfler, Kiryat Ata, both of Israel, assignors to Maytronics, Ltd., Kibbutz Yizrell, Israel

Filed Aug. 3, 2000, Appl. No. 631,520
Claims priority, application Israel, Aug. 3, 1999, 131222
Int. Cl. E04H *3/16*
U.S. Cl. 210—169 10 Claims



1. In combination with a swimming pool cleaning device comprising an outer shell with a detachable lid, said outer shell being open at its lower end, and an inner shell spaced apart therefrom,

open at its upper end and accommodating an impeller and a clean-water exit tube, the improvement comprising:

a filter element having a basket-like shape including a tubular central stem configured to be seated on said exit tube, said central stem being surrounded by an annular trough constituting the active filtering portion of said element, with the outer rim of said trough being detachably affixed to said inner shell,

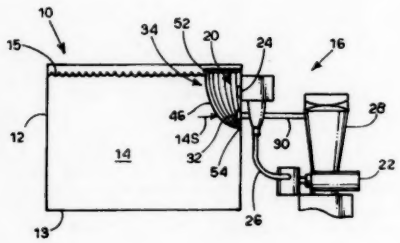
wherein, during operation of said device, solids-entraining water drawn by said impeller enters said annular trough from above and, passing said active filtering portion, emerges therefrom as clean water to be expelled through said exit tube and returned to said pool.

US 6,409,917 B1

ACCESSORY FOR USE IN A WATER TREATMENT SYSTEM OF A SWIMMING POOL

Carl J. Malone, Jr., 113 Julianne Ct., Manhattan, Ill. 60442-9267

Filed Aug. 2, 2001, Appl. No. 919,971
Int. Cl. E04H *4/14;4/16*
U.S. Cl. 210—169 **5 Claims**



5. A swimming pool water treatment system comprising:

a) a swimming pool side wall;

b) a body of water contained by said swimming pool side wall and having a water level;

c) a water treatment system fluidically connected to said body of water and including

(1) an intake/return port in said swimming pool side wall,

(2) a filter fluidically connected to said intake/return port,

(3) a pump fluidically connected to the filter;

d) a dam releasably fixed to said swimming pool side wall adjacent to the intake/return port of said water treatment system, said dam fluidically isolating the intake/return port of said water treatment system from water in said body of water, said dam including

(1) a first planar wall,

(2) a seal releasably mounting said first planar wall on said swimming pool side wall surroundingly adjacent to the intake/return port of said water treatment system,

(3) a fluid port through said first planar wall and located to be in fluid communication with the intake/return port of said water treatment system, said fluid port covering essentially the entire area of said first planar wall,

(4) a water-impervious wall fixed to said first planar wall, said water-impervious wall being in the approximate shape of a quarter-sphere and being corrugated and having a top rim which is arcuate and defines a fluid opening that is fluidically connected to the fluid port of said dam, the top rim of said water-impervious wall extending radially away from said first planar wall,

(5) said top rim being located above the water level of said body of water, and

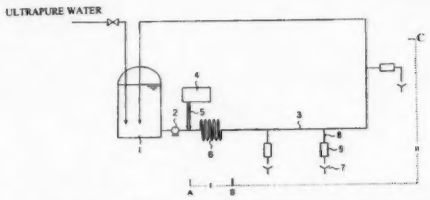
(6) a bottom rim on said first planar wall located beneath said intake/return port.

US 6,409,918 B1

APPARATUS FOR SUPPLYING OZONATED ULTRAPURE WATER

Hiroshi Morita, Hadano; Tetsuo Mizuniwa, Yokosuka, and Junichi Ida, Koga, all of Japan, assignors to Kurita Water Industries Ltd., Japan

Filed Nov. 4, 1998, Appl. No. 185,836
Claims priority, application Japan, Nov. 6, 1997, 9-304617
Int. Cl. C02F *1/78*
U.S. Cl. 210—192 **5 Claims**



1. An apparatus for supplying ozonated ultrapure water comprising:

a main ultrapure water supply line;

means for circulating ultrapure water in said main ultrapure water supply line;

an ozonated gas supply device;

an ozone branch pipe from said ozonated gas supply device to said main ultrapure water supply line;

a first output branch line of said main ultrapure water supply line located a first predetermined distance downstream of said ozone branch pipe;

said first predetermined distance being sufficient to permit an ozone concentration dissolved in said ultrapure water at said first output branch line to have reached a substantially stable level;

a second output branch line of said main ultrapure water supply line located a second predetermined distance downstream of said first output branch line; and

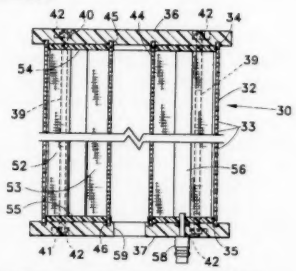
said second predetermined distance being small enough that an ozone concentration dissolved in said ultrapure water at said second output branch line remains at said substantially stable level.

US 6,409,919 B1

REUSABLE FILTER HOUSING WITH REPLACEABLE, DISPOSABLE FILTER CARTRIDGE

Stanley P. Tara, Fairport, N.Y., assignor to North American Filter Corporation, N.Y.

Filed Jan. 23, 2001, Appl. No. 766,702
Int. Cl. B01D *29/54*
U.S. Cl. 210—232 **13 Claims**



1. A fluid filter cartridge assembly, comprising

a pair of metal sleeves each having therethrough intermediate its ends a plurality of straining apertures, and one of said sleeves being smaller in diameter than the other,

a pair of end caps each having formed in one surface thereof a pair of radially spaced annular recesses disposed coaxially

one within the other, and one of which end caps has therethrough an opening for discharging filtered fluids,

said sleeves being releasably secured in radially spaced coaxial relation to each other between said end caps, and with opposite ends of said one sleeve being seated releasably and sealingly in said one recesses in said end caps, and with opposite ends of said other sleeve being releasably and sealingly seated in said other recesses in said end caps, and

an annular filter cartridge removably mounted coaxially in the radial space between said sleeves and having opposite ends thereof releasably and sealingly engaged with said end caps,

said cartridge comprising a pair of radially spaced, pleated filter elements disposed to have fed to the radial space therebetween the fluid that is to be filtered.

US 6,409,920 B1

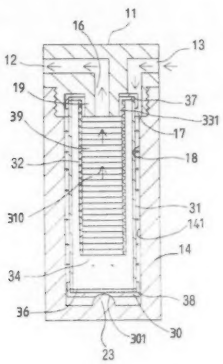
FILTER DEVICE HAVING A SIMPLIFIED CONFIGURATION

Tsung Hui Lee, P.O. Box 10-69, Chong Ho, Taipei, Taiwan, 235

Filed Jun. 7, 2001, Appl. No. 877,349

Int. Cl. B01D *35/30;39/20*

U.S. Cl. 210—232 **6 Claims**



1. A filter device comprising:

a filter housing including a chamber formed therein, and including an upper portion,

a cover attached on said upper portion of said filter housing and including a water inlet for receiving water and including a water outlet for allowing the water to flow out of said cover,

a first filter member and at least one second filter member received in said filter housing and disposed between said water inlet and said water outlet of said cover for filtering the water,

a pipe received in said filter housing for receiving said first filter member and at least one second filter member, and

a filter tube received in said filter housing and arranged between said water inlet and said water outlet of said cover for filtering the water from said water inlet of said cover, said pipe being received in said filter tube, and said filter tube being a porcelaneous filter tube.

US 6,409,921 B1

INTEGRALLY ASYMMETRICAL POLYOLEFIN MEMBRANE FOR GAS EXCHANGE

Marcus O. Müller, Arnhem, Netherlands; Erich Kessler, Hoschst im Odenw, Germany; Ralf R. Hornscheidt, Heiligenhaus, Germany; Frank Wiese, Wuppertal, Germany, and Armin J. Lang, Miltenberg, Germany, assignors to Membrana GmbH, Wuppertal, Germany

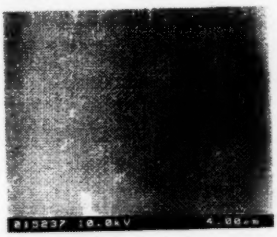
PCT No. PCT/EP98/04451, § 371 Date Feb. 28, 2000, § 102(e) Date Feb. 28, 2000, PCT Pub. No. WO99/04891, PCT Pub. Date Feb. 4, 1999

PCT Filed Jul. 16, 1998, Appl. No. 463,316

Claims priority, application Germany, Jul. 23, 1997, 197 31 677

Int. Cl. A61M *1/18;* **B01D** *63/02;61/00*

U.S. Cl. 210—644 **31 Claims**



1. Integrally asymmetrical hydrophobic membrane for gas exchange composed primarily of at least one polyolefin polymer and having first and second surfaces, the membrane having a support layer with a sponge-like, open-pored, microporous structure and adjacent to this support layer and comprising at least one of the first and second surfaces of the membrane, a separation layer with a structure that is denser than that of the support layer, wherein pores, if any, in the separation layer have an average diameter of <100 nm, wherein the support layer is free of macrovoids and the pores in the support layer are on average essentially isotropic, and wherein the membrane has a porosity in the range of greater than 50% to less than 75% by volume.

US 6,409,922 B1

CHROMATOGRAPHIC SEPARATION PROCESS AND CHROMATOGRAPHIC SEPARATOR

Kikuzo Kaneko; Takayuki Masuda; Fumihiko Matsuda; Kohei Sato, and Kouji Tanikawa, all of Tokyo, Japan, assignors to Organo Corporation, Tokyo, Japan

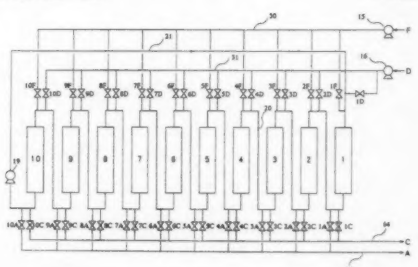
PCT No. PCT/JP98/05842, § 371 Date Aug. 16, 1999, § 102(e) Date Aug. 16, 1999, PCT Pub. No. WO99/33540, PCT Pub. Date Jul. 8, 1999

PCT Filed Dec. 24, 1998, Appl. No. 367,522

Claims priority, application Japan, Dec. 25, 1997, 9-366256

Int. Cl. B01D *15/08*

U.S. Cl. 210—659 **2 Claims**



1. A chromatographic separation process for separating a starting fluid material comprising at least three components into at least three fractions, said process comprising:

a) providing a chromatographic separator comprising a plurality of packing beds packed with chromatographic packing, said chromatographic packing at least in part comprising ion exchanger, and in which chromatographic separator at least the position of feeding desorbent is intermittently displaced in the direction of fluid flow;

b) separating said starting fluid material with said chromatographic separator to yield a plurality of fractions;

c) manipulating the ion exchanger so as to change at least part (based on ion exchange capacity) of the ionic form of part of said ion exchanger to yield changed ion exchanger; and

d) separating at least one of said fractions with said changed ion exchanger to yield a further plurality of fractions.

US 6,409,923 B1

METHOD FOR ENRICHING OPTICAL ISOMERS BY MEANS OF SIMULATED MOBILE BED

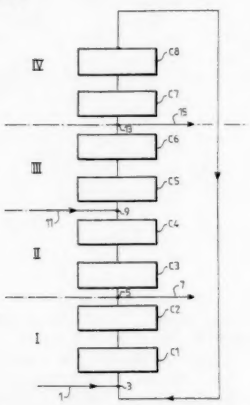
Roger-Marc Nicoud, Lay Saint Christophe; Frédéric Charton, Nancy, both of France, and Jean Blehaut, Swarthmore, Pa., assignors to Novasep S.A., Vandoeuvre-les-Nancy, France

PCT No. PCT/FR98/00550, § 371 Date Sep. 19, 2000, § 102(e) Date Sep. 19, 2000, PCT Pub. No. WO99/47228, PCT Pub. Date Sep. 23, 1999

PCT Filed Mar. 19, 1998, Appl. No. 646,466

Int. Cl. B01D *15/08*

U.S. Cl. 210—659 **11 Claims**



1. Method of separation of a mixture of two optical isomers adapted to be more or less immobilised in a chiral stationary phase, this method being of the type employing a simulated mobile bed, constituted by an assembly of columns (**C1**, **C2**, **C3**, **C4**, **C5**, **C6**, **C7**, **C8**) disposed in series, filled with a chiral stationary phase, which are divided into at least three successive zones (I, II, III), namely a first zone (I) at the inlet of which an eluent is injected and at the outlet of which a flux, called discharge flux, principally containing the more immobilised enantiomer, is drawn off, a second zone (II) at the outlet of which said mixture is injected, and a third zone (III) at the outlet of which a flux, called raffinate flux, principally containing the less immobilized enantiomer is drawn off, characterized in that, with respect to a reference state in which: a) the optical isomer more immobilised in the stationary phase is completely desorbed in the first zone (I) and is completely adsorbed in the third zone (III) and where the optical isomer less immobilised in the stationary phase is completely desorbed in the second zone (II), and b) the amount of charge is maximum,

the amount of charge injected is greater than that of the reference state,

the discharge flow is greater than that of the reference state if it is desired at least to preserve the purity of the less immobilised enantiomer, or the discharge flow is less than that of the reference state if it is desired at least to preserve the purity of the more immobilised enantiomer.

US 6,409,924 B1

METHOD FOR REMOVING OIL FROM WATER

Michael R. Johnson, Mandeville, and Jeffrey J. Smith, New Orleans, both of La., assignors to AMCOL International Corporation, Arlington Heights, Ill.

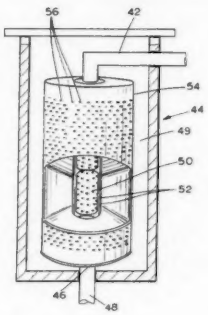
PCT No. PCT/US99/10759, § 371 Date Apr. 2, 2001, § 102(e) Date Apr. 2, 2001, PCT Pub. No. WO99/58218, PCT Pub. Date Nov. 18, 1999

Continuation-in-part of application No. 09/081,976, filed on May 14, 1998, now Pat. No. 5,935,444. This PCT application May 14, 1999, Appl. No. 674,340.

This patent is subject to a terminal disclaimer.

Int. Cl. B01D *17/02;* **C02F** *1/28*

U.S. Cl. 210—691 **6 Claims**



1. A method of separating water from a combination of water and oil comprising:

collecting the oil and water in a settling vessel and allowing the oil and water to settle to form a lower water layer and an upper oil layer, said lower water layer including an oil contaminant;

draining a portion of the water layer from said settling vessel;

treating said drained portion of the water layer by flowing said drained portion of said water layer into a vessel containing an organophilic clay, said water being at a pressure of at least 5 psig within said vessel, for intimate contact of said drained water with said organophilic clay and adsorption of said oil contaminant on said organophilic clay; and

flowing the treated water out of said organophilic clay-containing vessel.

US 6,409,925 B1

DEVICE AND SYSTEM FOR TRANSFER OF MATERIAL

Moshe Gombinsky, Bat-Yam, and Anna Khatskina, Ariel, both of Israel, assignors to Bio-Magnetics Ltd., Bat-yam, Israel

PCT No. PCT/IL99/00078, § 371 Date Aug. 7, 2000, § 102(e) Date Aug. 7, 2000, PCT Pub. No. WO99/40444, PCT Pub. Date Aug. 12, 1999

PCT Filed Feb. 5, 1999, Appl. No. 601,741

Claims priority, application Israel, Feb. 6, 1998, 123210

Int. Cl. B01D *35/06;24/00;* **B03C** *1/100;* **G01N** *33/536*

U.S. Cl. 210—695 **8 Claims**

1. A system for transfer of solid magnetic particles from a plurality of source vessels to a plurality of target vessels such that material from each source vessel is transferred to a designated target vessel, the system comprising a plurality of detachably connected collecting members permitting simultaneous transfer of solid particles from a number of source vessels to one or more target vessels; each collecting member is made of a material which is not affected by a magnetic field, having a truncated particle collecting tip and an elongated lumen with an open end, said end of the lumen being at a distal portion of said elongated member adjacent to said tip; the lumen accommodating a magnetic field providing member within the lumen, which member is displaceable between a first position in which the magnetic field providing

member is in said distal portion whereby attraction of said particles to said truncated tip occurs, and a second position in a proximal portion of said lumen in which said particles are not attracted to said truncated tip, transition between the first position and the second position is controlled by electric or pneumatic force; each collecting member is independently controlled.

US 6,409,926 B1

AIR AND WATER PURIFICATION USING CONTINUOUS BREAKPOINT HALOGENATION AND PEROXYGENATION

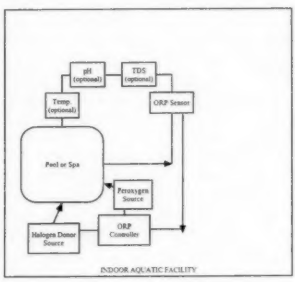
Roy Martin, Downers Grove, Ill., assignor to United States Filter Corporation, Palm Desert, Calif.

Continuation-in-part of application No. 09/260,810, filed on Mar. 2, 1999, now Pat. No. 6,149,819. This application Nov. 6, 2000, Appl. No. 707,422.

This patent is subject to a terminal disclaimer.

Int. Cl. C02F *1/52*

U.S. Cl. 210—709 **24 Claims**



1. A process for removing volatile halogenated compounds including chloramines and/or bromamines from the air and treating a body of water in an indoor aquatic facility comprising:

disposing an oxidation-reduction potential (ORP) sensor in fluid communication with a body of water within said facility;

continuously monitoring the ORP of said body of water;

comparing the monitored ORP to a set-point value calculated to be within a range effective to permit oxidation of said volatile halogenated compounds wherein the effective range of ORP is from 700 mv–850 mv;

adding a halogen donor source in an amount and at a rate sufficient to realize an optimum free halogen level sufficient to sanitize said body of water;

feeding a coagulating agent in an amount effective to reduce the amount of halogen donor required to maintain the ORP within said effective range;

adding a peroxygen compound at a rate and in an amount sufficient to maintain the ORP within said effective range;

optimizing the ratio of halogen donor source to peroxygen compound to sustain the optimum free halogen level while maintaining the effective ORP value;

maintaining a sustained high rate of oxidation in said body of water sufficient to cause the volatile halogenated compounds in the air to be reabsorbed therein; and

oxidizing the reabsorbed compounds.

US 6,409,927 B1

PROCESS FOR THE TREATMENT OF POLLUTED METAL-MECHANIC INDUSTRIAL WASTEWATER AND URBAN WATER

Enrique-Ruben Cardenas-Granguillhome, and Juan-JoséGonzalez-Garza, both of Lago Zumpamgo No. 6713, Esquina con Lago Zurich Colonia Lagos del Bosque, Monterrey, Nuevo León, Mexico

Continuation-in-part of application No. 09/090,006, filed on Jun. 3, 1998, now abandoned. This application Jul. 10, 2000, Appl. No. 612,691.

Int. Cl. C02F *1/52*

U.S. Cl. 210—715 **5 Claims**

1. Process for the treatment of polluted metal-mechanical industrial waste water and urban water, comprising: treating the polluted water with about 400 to about 2000 grams of acid liquor, including ferrous chloride and hydrochloric acid, per cubic meter of polluted water, to form a clarifying flocculus resulting from the precipitation of the ferrous ion which adsorbs protein present in the metal-mechanical industrial waste water or urban water.

US 6,409,928 B1

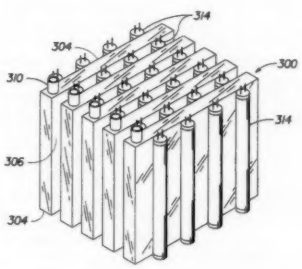
PHOTOCATALYTIC OXIDATION OF ORGANICS USING A POROUS TITANIUM DIOXIDE MEMBRANE AND AN EFFICIENT OXIDANT

Anuncia Gonzalez, San Jose, Calif.; Oliver J. Murphy, and Carlos Salinas, both of Bryan, Tex., assignors to Lynntech, Inc., College Station, Tex.

Continuation of application No. 09/115,358, filed on Jul. 14, 1998, now Pat. No. 6,136,186, which is a continuation-in-part of application No. 08/791,599, filed on Jan. 31, 1997, now Pat. No. 5,779,912. This application Oct. 5, 2000, Appl. No. 679,891.

Int. Cl. C02F *1/32;1/72;* **B01J** *19/12*

U.S. Cl. 210—748 **50 Claims**



1. An apparatus for oxidizing organic contaminants, comprising:

a substrate having a photocatalytic surface;

a fluid cell in communication with the photocatalytic surface of the substrate, the fluid cell comprising two opposing ultraviolet transmission surfaces positioned to expose the photocatalytic surface to ultraviolet light, a fluid inlet, and a fluid outlet, wherein the fluid cell is generally flat;

at least one oxidant cell adjacent to at least one side of the fluid cell, the oxidant cell comprising an oxidant inlet;

a porous wall separating the oxidant cell from the fluid cell, wherein an oxidant flows through the porous wall; and

an ultraviolet light source adjacent to the ultraviolet transmission surfaces.

US 6,409,929 B2

STEAM DRYING OF ROTARY FILTER CAKES WITHOUT CRACK FORMATION

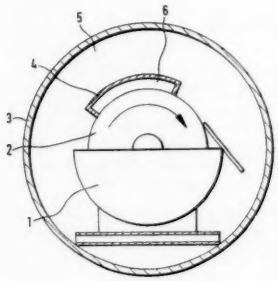
Reinhard Bott, Karlsruhe; Robert Kern, Weingarten, and Thomas Langeloh, Karlsruhe, all of Germany, assignors to BOKELA Ingenieurgesellschaft fur Mechanische Verfahrenstechnik mbH, Germany

Continuation of application No. 08/631,967, filed on Apr. 15, 1996, now abandoned, which is a continuation of application No. 08/631,937, filed on Apr. 15, 1996, now abandoned, which is a continuation of application No. 08/432,169, filed as application No. PCT/EP93/03148, filed on Nov. 10, 1993, now abandoned. This application Mar. 11, 1997, Appl. No. 815,185.

Claims priority, application Germany, Nov. 11, 1992, 42 38 087

Int. Cl. B01D *37/00*

U.S. Cl. 210—770 5 Claims



1. A method for the removal of moisture from a filter cake formed on a filtering surface of a filtering apparatus comprising:

a rotatable filter including a filtering surface on which said filter cake is formed;

a suspension trough in which said filter is rotatably positioned;

a pressure tight housing in which said suspension trough and said filter are completely enclosed in a pressure tight manner, said pressure tight housing defining a first pressure chamber filled with a pressurized first gas at a pressure above atmospheric, said first gas being used for generating a differential pressure for forming the filter cake on said filter;

a hood positioned within said pressure tight housing, said hood covering at least a section of said filtering surface, thereby defining a second pressure chamber, said second pressure chamber containing gaseous treatment fluid which is different from the first gas, said gaseous treatment fluid being heated vapour for treating said filter cake, the method comprising:

presenting the filter cake in a liquid saturated state saturated with a mother liquid; exposing and condensing the gaseous treatment fluid to form a liquid phase of the treatment fluid while the filter cake is in a liquid saturated state saturated with the mother liquid; wherein a pressure and temperature of the treatment fluid is set such that;

a thermodynamic state-point of the gaseous treatment fluid is near a condensation point of the gaseous treatment fluid;

the treatment fluid initially penetrates into a top layer of the filter cake furthest away from the filtering surface, cools and condenses thereby forming a condensation front in an area of the filter cake; the filter cake is progressively heated up by the treatment fluid to the temperature of the gaseous treatment fluid from the top layer to the filtering surface; and the condensation front is displaced towards the filtering surface; and

by displacing the condensation front the mother liquid is replaced by the treatment fluid.

US 6,409,930 B1

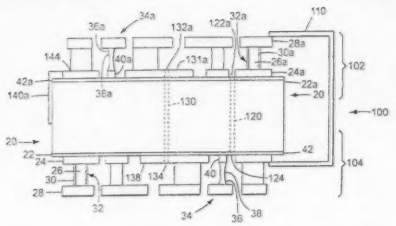
LAMINATION OF CIRCUIT SUB-ELEMENTS WHILE ASSURING REGISTRATION

Donald A. Whitehurst, Minneapolis; Paul D. Wyatt; Jose F. Brenes, both of St. Paul; Jeffrey M. Borning, Rosemount, and Bruce A. Finger, St. Paul, all of Minn., assignors to BMC Industries, Inc., Minneapolis, Minn.

Filed Nov. 1, 1999, Appl. No. 432,475

Int. Cl. H01B *13/00*

U.S. Cl. 216—13 43 Claims



1. A process for the formation of an article having multiple electrical circuits, the process comprising:

providing a first sub-element comprising a first metal layer in electrical contact with a second metal layer in electrical contact with a third metal layer;

etching an electrical circuit design in said first metal layer so that at least one circuit element in a pattern of elements is formed and in a separate etch step, etching away at least 10%, but less than 100% of the second metal layer to provide electrical connections between said first metal layer and said third metal layer;

etching an electrical circuit design into the third metal layer;

adhering an etched surface comprising the circuit design of the first metal layer to a support layer to form a circuit board;

wherein adhering said etched surface is performed with said at least one element of the pattern being positioned in a registry with a second element associated with the support and then said etched surface is adhered to a first surface of the support while registry is maintained between said at least one circuit element in a pattern of elements and said second element associated with the support.

US 6,409,931 B1

METHOD OF PRODUCING INK JET RECORDING HEAD AND INK JET RECORDING HEAD

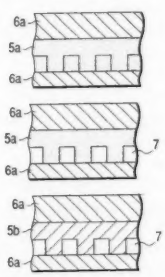
Akihiko Shimomura, Yokohama; Susumu Kadokura, Iwai; Hiroto Matsuda, Ebina, and Isao Imamura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1999, Appl. No. 245,109

Claims priority, application Japan, Jan. 26, 1998, 10-012861

Int. Cl. B41J *2/04;2/16;* G01D *15/18*

U.S. Cl. 216—27 33 Claims



1. A method of producing an ink jet recording head, in which a discharge port surface provided with a discharge port, through which ink is discharged, is provided comprising:

a conductive treatment step of carrying out a conductive treatment of said discharge port surface in a state where a material is present in a portion of said discharge port;

a removing step of removing said material to open said discharge port; and

an electrolytic deposition step of electrolytically depositing a water repellent material in the conduction-treated region of said discharge port surface.

US 6,409,932 B2

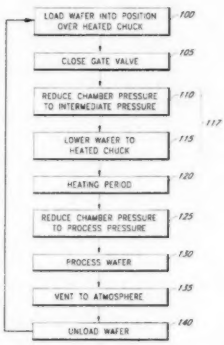
METHOD AND APPARATUS FOR INCREASED WORKPIECE THROUGHPUT

Albert Wang, Moraga; Scott Baron, Menlo Park; Prasad Padmanabhan, San Francisco, and Gerald M. Cox, Lafayette, all of Calif., assignors to Matrix Integrated Systems, Inc., Richmond, Calif.

Provisional application No. 60/194,227, filed on Apr. 3, 2000. This application Dec. 27, 2000, Appl. No. 749,648.

Int. Cl. B01J *15/00*

U.S. Cl. 216—55 **23 Claims**



1. A method of thermally treating a workpiece at low treatment pressure, comprising:

loading the workpiece into a process chamber at a load/unload pressure;

changing pressure in the process chamber to an intermediate pressure between the load/unload pressure and a treatment pressure;

heating the workpiece to a process temperature at the intermediate pressure, wherein heating includes moving the workpiece from a load/unload position to a process position at the intermediate pressure;

reducing pressure in the process chamber to the treatment pressure; and

treating the workpiece at the treatment pressure and process temperature.

US 6,409,933 B1

PLASMA REACTOR HAVING A SYMMETRIC PARALLEL CONDUCTOR COIL ANTENNA

John Holland, San Jose; Valentin N. Todorow, Fremont, and Michael Barnes, San Ramon, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jul. 6, 2000, Appl. No. 610,800

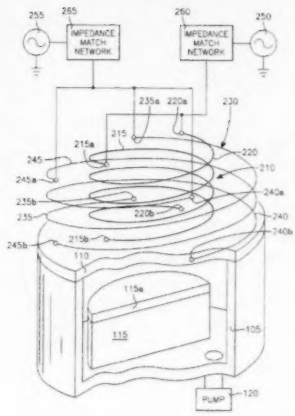
Int. Cl. H01L *21/00*

U.S. Cl. 216—68 **25 Claims**

1. A plasma reactor for processing a workpiece, said reactor comprising:

a vacuum chamber having a ceiling and defining an axis of symmetry;

a workpiece support pedestal within the chamber;



an outer coil antenna adjacent the chamber, said outer coil antenna comprising a first plurality of conductors wound symmetrically about the axis;

an inner coil antenna adjacent the chamber, said inner coil antenna comprising a second plurality of conductors wound symmetrically about the axis;

wherein the number of said first plurality of conductors is greater than the number of said second plurality of conductors; and

an RF plasma source power supply, the conductors in at least one of said first and second pluralities of conductors being connected in parallel across said RF plasma source power supply.

US 6,409,934 B1

POLYESTER FIBER TREATMENT AGENT COMPOSITION

Tsutomu Naganawa; Isao Ona, and Tadashi Takimoto, all of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Oct. 23, 2000, Appl. No. 694,468

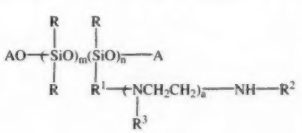
Claims priority, application Japan, Oct. 29, 1999, 11-309033

Int. Cl. D06M *15/37*

U.S. Cl. 252—8.63 **2 Claims**

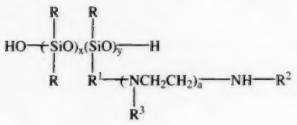
1. A polyester fiber treatment composition comprising a water-based emulsion containing

(A) an aminofunctional organopolysiloxane of the formula



in which R is a C_1 to C_{20} subtituted or unsubstituted monovalent hydrocarbon group, R^1 is a C_1 to C_{10} divalent hydrocarbon group, R^2 and R^3 are each the hydrogen atom or a C_1 to C_{20} unsubstituted monovalent hydrocarbon group, A is a C_1 to C_{20} alkyl group, m and n are each at least 1, and a is 0–5;

(B) an aminofunctional organopolysiloxane of the formula

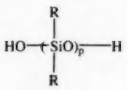


in which R is a C_1 to C_{20} substituted or unsubstituted monovalent hydrocarbon group, R^1 is a C_1 to C_{10} divalent hydrocarbon group, R^2 and R^3 are each the hydrogen atom or a C_1 to C_{20} unsubstituted monovalent hydrocarbon group, x and y are each at least 1, and a is 0–5; where (A) and (B) are present in the ratio of 1:0.1 to 1:10 on a weight basis;

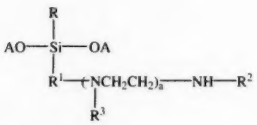
(C) an nonionic surfactant; and (D) water;

with the proviso that

(A) its a reaction product of a diorganopolysiloxane or a diorganosilane of the formula



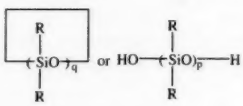
in which R is the same as defined above in (A), and p is at least one; and an organoalkoxysilane of the formula



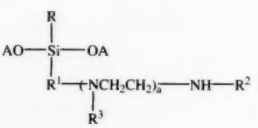
in which R, R^1, R^2, R^3, A, and a, are the same as defined above in (A);

and with the further proviso that

(B) is a base catalyzed reaction product of a diorganosilane Or a diorganosiloxane of the formula



in which R and p are the same as defined above in (B), and q is at least 3; and a hydrolysis and condensation product of an organoalkoxysilane of the formula



in which R, R^1, R^2, R^3, A, and a, are the same as defined above in (B).

US 6,409,935 B1

FULLERENE-ADDED LEAD ZIRCONATE TITANATE AND METHOD OF PRODUCING THE SAME

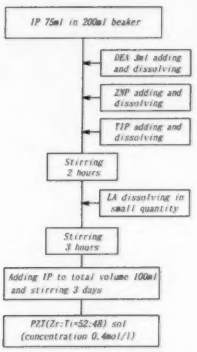
Kun-ichi Miyazawa; Kunio Ito, both of Tokyo; Toru Kuzumaki, Kawasaki, and Fumie Seki, Kunitachi, all of Japan, assignors to Tokyo, The University of, Tokyo, Japan

Filed Feb. 22, 2000, Appl. No. 510,056

Claims priority, application Japan, Mar. 25, 1999, 11-081100

Int. Cl. C04B *35/48;35/00;35/491*

U.S. Cl. 252—62.9 PZ **9 Claims**


1P 75ml in 200ml beaker
DEA 3ml adding and dissolving
ZNP adding and dissolving
TIP adding and dissolving
Stirring 2 hours
LA dissolving in small quantity
Stirring 3 hours
Adding 1P to total volume 100ml and stirring 3 days
PZT(Zr:Ti=52:48) sol (concentration 0.4mol/l)

1. A method of producing a fullerene-added lead zirconate titanate which comprises dissolving zirconium alkoxide, titanium alkoxide and lead acetate in an organic solvent with a stabilizer to form a colloidal solution (sol), adding a fullerene thereto, gelatinizing, drying and firing.

US 6,409,936 B1

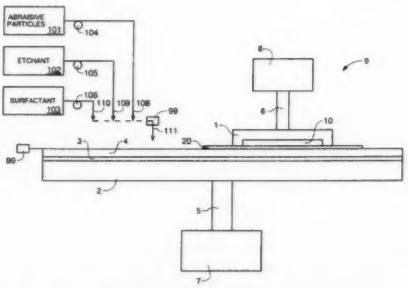
COMPOSITION AND METHOD OF FORMATION AND USE THEREFOR IN CHEMICAL-MECHANICAL POLISHING

Karl M. Robinson, and Whonchee Lee, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Feb. 16, 1999, Appl. No. 252,022

Int. Cl. C09R *13/00*

U.S. Cl. 252—79.1 **33 Claims**



1. A process for mixing a polishing composition for chemical-mechanical polishing (CMP) of a substrate assembly, the process comprising:

providing Corundum abrasive particles;

providing etchant;

providing a nonionic surfactant Brij®58 (polyoxyethylene cetyl ether);

mixing of the abrasive particles, the etchant, and the surfactant proximate a polishing location to form the polishing composition; and

using the polishing composition within a range of approximately 0 to 150 seconds from the mixing wherein a turbidity of the abrasive particles lies in a range of approximately 100 to 50 percent.

US 6,409,937 B1

MELT PROCESSIBLE THERMOTROPIC LIQUID CRYSTALLINE TERPOLYESTERS AND PROCESS FOR THE PREPARATION THEREOF

Vadakkethonippurathu Sivankutty Nair Prasad; Chennakkattu Krishna Sadasivan Pillai, both of Kerala, and Marayil Ravindranathan, Gujarat, all of India, assignors to Council of Scientific & Industrial Research, and Department of Science and Technology, both of New Delhi, India

Filed Mar. 28, 2000, Appl. No. 537,248

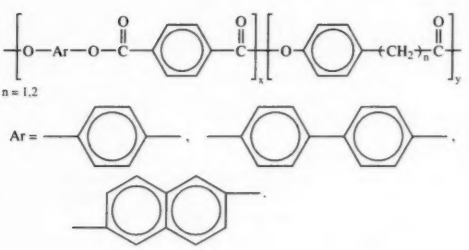
Int. Cl. C09K *19/20;19/38;* **C08G** *63/60;63/81;63/83;63/78;63/88*

U.S. Cl. 252—299.67 **12 Claims**

1. Novel melt processible thermotropic liquid crystalline terpolyesters of the general formula I

scheme 1
structure of poly[aryleneterephthalate-co-(4-oxyphenyl)acetal propionate]

Formula I



US 6,409,938 B1

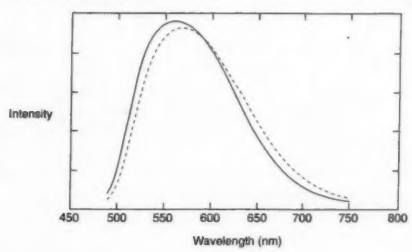
ALUMINUM FLUORIDE FLUX SYNTHESIS METHOD FOR PRODUCING CERIUM DOPED YAG

Holly Ann Comanzo, Niskayuna, N.Y., assignor to The General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 2000, Appl. No. 534,576

Int. Cl. C09K *11/08*

U.S. Cl. 252—301.4 R **43 Claims**



1. A phosphor comprising:

$$A_3D_5E_{12}:Ce^{3+},$$

wherein

A comprises at least one of Y, Gd, Lu, Sm and La;

D comprises at least one of Al, Ga, Sc and In;

E comprises oxygen;

Y, Al and oxygen comprise a crystal lattice of the phosphor; and the phosphor luminosity is greater than 435 lumens per watt.

US 6,409,939 B1

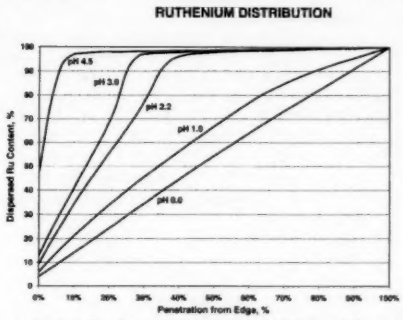
METHOD FOR PRODUCING A HYDROGEN-RICH FUEL STREAM

Suheil F. Abdo, Lincolnshire; Cynthia A. DeBoy, Naperville, and Geralyn F. Schroeder, Roselle, all of Ill., assignors to UOP LLC, Des Plaines, Ill.

Filed May 31, 2000, Appl. No. 583,618

Int. Cl. C07C *1/02;* **C10K** *1/02*

U.S. Cl. 252—373 **10 Claims**



1. A process for the generation of a hydrogen-rich fuel gas stream for use in a fuel cell for the generation of electric power, said process comprising:

a) passing a feed stream comprising a hydrocarbon or an oxygenate to a fuel processor comprising an integrated reforming and water gas shift conversion zone to produce a fuel stream comprising hydrogen, carbon monoxide, carbon dioxide and water;

b) passing the fuel stream at an oxidation temperature between about 70° and about 160° C. in the presence of an oxygen-containg stream to a preferential oxidation zone containing a preferential oxidation catalyst to produce the hydrogen-rich fuel gas stream comprising less than about 50 ppm-vol carbon monoxide, said preferential oxidation catalyst comprising ruthenium metal dispersed on a shaped alumina carrier, said carrier having a center and a surface, and a distance from said center to said surface at least 60 percent of the ruthenium metal being present in a band extending from the surface towards the center and having a width of about 50 percent of the distance from the surface to the center of the shaped alumina carrier; and

c) passing the hydrogen-rich fuel gas stream to a fuel cell for the generation of electric power and withdrawing electric power.

US 6,409,940 B1

NICKEL-RHODIUM BASED CATALYSTS AND PROCESS FOR PREPARING SYNTHESIS GAS

Anne M. Gaffney, and David R. Corbin, both of West Chester, Pa., assignors to Conoco Inc., Houston, Tex.

Provisional application No. 60/160,100, filed on Oct. 18, 1999. This application Oct. 13, 2000, Appl. No. 687,684.

Int. Cl. C07C *1/02;* **C01B** *3/02;3/24;3/26;31/18*

U.S. Cl. 252—373 **32 Claims**

1. A process of preparing a product gas mixture comprising CO and H_2 from a C_1–C_5 hydrocarbon and O_2, the process comprising:

contacting a reactant gas mixture comprising said hydrocarbon and a source of molecular oxygen with a catalytically effective amount of a supported catalyst comprising a nickel-rhodium alloy containing about 1–50 weight percent nickel

and about 0.01–10 weight percent rhodium, and optionally further comprising, at least one metal chosen from the group consisting of lanthanide elements, zirconium, cobalt, manganese and magnesium, and a support structure; and

maintaining said supported catalyst and said reactant gas mixture at catalytic partial oxidation promoting conditions of temperature, gas flow rate and feed composition during said contacting.

US 6,409,941 B1

BLOCK OLIGOMERS CONTAINING 1-HYDROCARBYLOXY-2,2,6,6-TETRAMETHYL-4-PIPERIDYL GROUPS AS STABILIZERS FOR ORGANIC MATERIALS

James Peter Galbo, Wingdale, N.Y.; Nicola Lelli, Basel, Switzerland; Valerio Borzatta, Bologna, Italy; Jean-Pierre Wolf, Courtaman, Switzerland; Michael Ackerman, New City, N.Y., and Piero Piccinelli, Sasso Marconi, Italy, assignors to Ciba Specialty Chemicals Corp., Tarrytown, N.Y.

PCT No. PCT/IB98/00715, § 371 Date Nov. 18, 1999, § 102(e) Date Nov. 18, 1999, PCT Pub. No. WO98/54175, PCT Pub. Date Dec. 3, 1998

PCT Filed May 14, 1998, Appl. No. 424,141

Claims priority, application European Pat. Off., May 27, 1997, 97810328

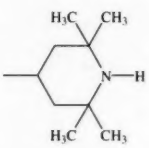
This patent is subject to a terminal disclaimer.

Int. Cl. C07D *401/12;401/14;* **C08K** *5/3492*

U.S. Cl. 252—401 **26 Claims**

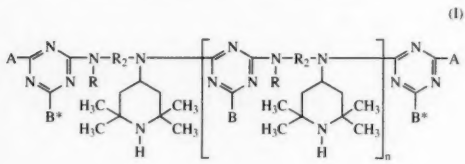
1. A product obtained by transforming groups of the formula (G-I)

(G-I)



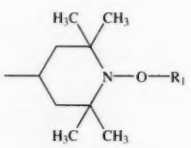
being present in a block oligomer having a polydispersity $\bar{M}w/\bar{M}n$ of 1 to 1.7 and corresponding to the formula (I)

(I)



to groups of the formula (G-II);

(G-II)



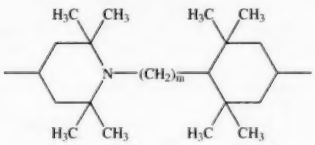
wherein R_1 is a hydrocarbyl radical or —O—R_1 is oxyl;

said transformation is carried out by reaction of the block oligomer corresponding to the formula (I) with a hydroperoxide in a hydrocarbon solvent in the presence of a peroxide decomposing catalyst;

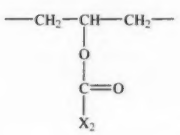
n is a number from 2 to 14;

the radicals R_2 are independently of one another C_2–C_{12}alkylene, C_4–C_{12}alkenylene, C_5–C_7cycloalkylene, C_5–C_7cycloalkylenedi(C_1–C_4alkylene), C_1–C_4alkylenedi-(C_5–C_7cycloalkylene), phenylenedi(C_1–C_4alkylene) or C_4–C_{12} alkylene interrupted by 1,4-piperazinediyl, —O— or >N—X_1 with X_1 being C_1–C_{12}acyl or (C_1–C_{12}alkoxy)carbonyl or having one of the definitions of R_4 given below; or R_2 is a group of the formula (a), (b) or (c);

(a)



(b)



(c)

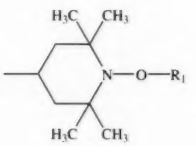
with m being 2 or 3,

X_2 being C_{12}–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or substituted by 1, 2 or 3 C_1–C_4alkyl; phenyl which is unsubstituted or substituted by 1, 2 or 3 C_1–C_4alkyl or C_1–C_4alkoxy; C_7–C_9phenylalkyl which is unsubstituted or substituted on the phenyl by 1, 2 or 3 C_1–C_4alkyl; and

the radicals X_3 being independently of one another C_2–C_{12}alkylene;

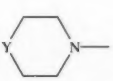
the radicals A are independently of one another —OR_3, —$N(R_4)(R_5)$ or a group of the formula (11);

(G-II)



R_3, R_4 and R_5, which are identical or different, are C_1–C_{18}alkyl, C_5–C_{12} cycloalkyl which is unsubstituted or substituted by 1, 2 or 3 C_1–C_4alkyl; C_3–C_{18}alkenyl, phenyl which is unsubstituted or substituted by 1, 2 or 3 C_1–C_4alkyl or C_1–C_4alkoxy; C_7–C_9phenylalkyl which is unsubstituted or substituted on the phenyl by 1, 2 or 3 C_1–C_4alkyl; tetrahydrofurfuryl or C_2–C_4alkyl which is substituted in the 2, 3 or 4 position by —OH, C_1–C_8alkoxy, di(C_1–C_4alkyl)amino or a group of the formula (III);

(III)



with Y being —O—, —CH_2—, —CH_2CH_2— or >N—CH_3;
and R_3 is additionally hydrogen or —$N(R_4)(R_5)$ is additionally a group of the formula (III);
X is —O— or >N—R_6;
R_6 is C_1–C_{18}alkyl, C_3–C_{18}alkenyl, C_5–C_{12}cycloalkyl which is unsubstituted or substituted by 1, 2 or 3 C_1–C_4alkyl; C_7–C_9phenylalkyl which is unsubstituted or substituted on the phenyl by 1, 2 or 3 C_1–C_4alkyl; tetrahydrofurfuryl, a group of the formula (G-I), or C_2–C_4alkyl which is substituted in the 2, 3 or 4 position by —OH, C_1–C_8alkoxy, di(C_1–C_4alkyl)amino or a group of the formula (III);
the radicals R have independently of one another one of the meanings given for R_6; and
the radicals B and B* have independently of one another one of the meanings given for A;
with the proviso that in the individual recurrent units of the formula (I), each of the radicals B, R and R_2 has the same or a different meaning.

US 6,409,942 B1

ELECTRICALLY CONDUCTIVE COMPOSITIONS AND METHODS FOR PRODUCING SAME

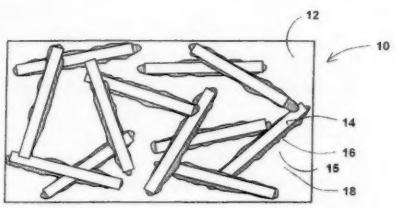
Moshe Narkis; Rosa Tchoudakov; Arnon Siegmann, and Anita Vaxman, all of Haifa, Israel, assignors to Carmel Olefins Ltd., Haifa, Israel

Continuation-in-part of application No. 08/999,798, filed on Sep. 18, 1997, now Pat. No. 5,958,303, Provisional application No. 60/030,621, filed on Nov. 7, 1996. This application Feb. 3, 1999, Appl. No. 244,249.

This patent is subject to a terminal disclaimer.

Int. Cl. H01B *1/24*

U.S. Cl. 252—511 **24 Claims**



1. An electrically conductive composition comprising:
a matrix comprising substantially a first thermoplastic component selected from polybutylene terephthalate, polycarbonate and polycarbonate acrylonitrile butadiene styrene;
a second thermoplastic component having a higher polarity than that of said first thermoplastic component, said second component encapsulating a plurality of fibers forming a network of encapsulated fibers within said matrix; and
a carbon component preferentially attracted to said second component so as to make said network an electrically conductive network within said matrix, said carbon component located at the interface between said second thermoplastic component and said matrix wherein said carbon component is carbon black and is present in an amount less than 10 parts per hundred.

US 6,409,943 B1

IN-SITU-GENERATED SOLID RADIATION SOURCE BASED ON TUNGSTEN 188 /RHENIUM 188 AND USE THEREOF

Efraim Lavie, Mazkeret-Batia; Daniel Kijel, Rischon-Lezion; Eliahu Sayag, Holon, and Yehoshua Michael Bettan, Metar, all of Israel, assignors to The State of Israel, Atomic Energy Commission, Israel

Continuation-in-part of application No. 08/975,562, filed on Nov. 21, 1997, now abandoned. This application Apr. 25, 2000, Appl. No. 557,130.

Claims priority, application Israel, Nov. 3, 1997, 122094

Int. Cl. A61K *51/00;* **A61M** *36/12;* **A61N** *5/10;* **G21G** *4/08*

U.S. Cl. 252—644 **35 Claims**

1. A method of making a therapeutic device comprising providing a radioactive solid source made of or coated with solid Tungsten metal and irradiating said source to produce a radioactive source for the in situ generation of $Rhenium^{188}$ from $Tungsten^{188}$.

US 6,409,944 B1

METHOD FOR PRODUCING A FILTER BOTTOM FOR WATER TREATMENT

Didier Perrin, Cormeilles en Parisis, and Alain Motte, Bougival, both of France, assignors to Degremont, Rueil Malmaison, France

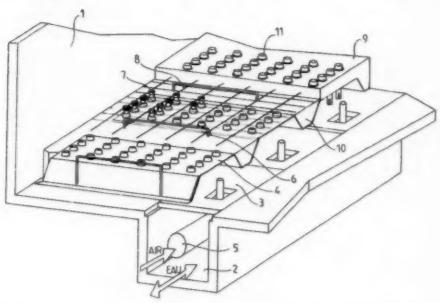
PCT No. PCT/FR98/00146, § 371 Date Sep. 24, 1999, § 102(e) Date Sep. 24, 1999, PCT Pub. No. WO98/36816, PCT Pub. Date Aug. 27, 1998

PCT Filed Jan. 27, 1998, Appl. No. 355,843

Claims priority, application France, Feb. 19, 1997, 97 01963

Int. Cl. E04B *1/16*

U.S. Cl. 264—32 **4 Claims**



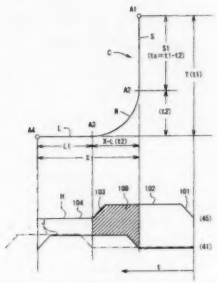
1. A method of producing a filter floor in a liner for treating water, the filter floor having a structure resting on the bottom of the liner and a supporting slab which has a number of orifices formed therein intended to receive suction strainers, the structure and the slab being formed by the steps comprising:
assembling lost formwork elements in the lining to create the shape of the structure and the slab;
the shape of the structure and the slab being obtained by placing lost formwork elements of one single design, side by side on the bottom of the liner, the elements being held together by fixing means; and
casting concrete directly into the lost formwork.

US 6,409,945 B1

METHOD OF CONTROLLING AN APPARATUS FOR TAKING OUT AN INJECTION-MOLDED PRODUCT AND THE APPARATUS FOR CARRYING OUT THE METHOD

Koji Yamamoto, Kyoto, Japan, assignor to Kabushiki Kaisha Yushin Seiki, Kyoto, Japan

Filed Dec. 8, 1999, Appl. No. 456,309
Claims priority, application Japan, Dec. 8, 1998, 10-348314
Int. Cl. B29C *45/80*
U.S. Cl. 264—40.1 **4 Claims**



1. A method of controlling an apparatus for taking out an injection-molded product, the apparatus being capable of taking out a injection-molded product (**10**) from a mold in an open state while being held by a product holder (**42**) and releasing it at a releasing position, the apparatus comprising: clamping direction driving means for moving a product holder (**42**) in a clamping direction; and ingress direction driving means for moving the product holder (**42**) in a direction at a right angle to the clamping direction such that the clamping direction driving means is operated during the operation of the ingress direction driving means and after stoppage thereof, whereby the product holder (**42**) is moved along a locus (C) starting from a waiting position (A1) via an initial linear zone (S), a curve zone (R) and a final linear zone (L) to a holding position (A4) for holding the product (**10**), the method comprising the steps of: determining a complementary time required for the movement of the product holder (**42**) toward a clamping direction from a starting position of movement in the clamping direction by a distance equal to a difference between a length from the waiting position (A1) to the holding position (A4) in the clamping direction and the length of the final linear zone (L); subtracting the complementary time from a ingress time required for the movement of the product holder (**42**) from the waiting position (A1) to a point on a straight line between the male and female molds in an open state; and adopting, as the length of the initial linear zone (S), a linear distance along which the product holder (**42**) moves from the waiting position (A1) toward a point on a linear line until the product holder (**42**) reaches the curved zone (R) for the same period of time as given by the subtraction.

US 6,409,946 B1

HIGH-PRODUCTIVITY SINGLE-STAGE METHOD AND APPARATUS FOR PRODUCING CONTAINERS MADE OF THERMOPLASTIC MATERIAL

Ireneo De Nardi, Cordignano; Alberto Armellin, Vittorio Veneto; Luigi Rodighiero, Montebelluna, and Nicola Da Riol, Porcia, all of Italy, assignors to Sipa S.p.A., Vittorio Veneto, Italy

PCT No. PCT/EP98/03793, § 371 Date Aug. 20, 1999, § 102(e) Date Aug. 20, 1999, PCT Pub. No. WO99/01267, PCT Pub. Date Jan. 14, 1999
PCT Filed Jun. 22, 1998, Appl. No. 367,656
Claims priority, application Italy, Jul. 3, 1997, PN97A0039
Int. Cl. B29C *49/64;49/78*
U.S. Cl. 264—40.6 **19 Claims**

1. Single-stage method for the production of preforms of thermoplastic resin comprising the steps of:

filling a plurality of multiple-cavity molds with molten resin for forming said preforms,

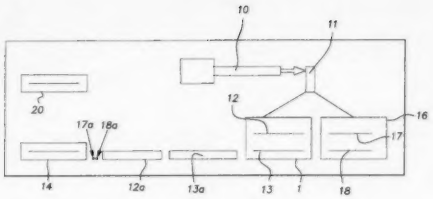
holding and cooling down said molten resin inside said molds,

removing the molded preforms from said molds,

subjecting said preforms to a subsequent temperature conditioning stage,

transferring said preforms to appropriate blow-molding tools and clamping them therein for their final stretch-blow molding operation,

wherein each one of said multiple-cavity molds comprises a plurality of cavities defined in several (n) distinct clusters belonging to the same mold, said cavities being cooled down by means of a forced circulation of cooling medium through appropriate cooling conduits provided in the body of each such mold, wherein the cavities belonging to a same cluster are cooled in a distinct and differentiated manner with respect to the cavities belonging to the other clusters of cavities provided in the same mold.



US 6,409,947 B1

BLOW MOLDED HEADLINER

Gloria D. Wandyez, Birmingham, Mich., assignor to Textron Automotive Company, Inc., Troy, Mich.

Division of application No. 09/116,163, filed on Jul. 16, 1998, now Pat. No. 6,086,145. This application May 23, 2000, Appl. No. 576,776.
Int. Cl. B29C *44/06;* **B49C** *49/04*
U.S. Cl. 264—45.9 **15 Claims**

1. A method for making a headliner comprising a substrate configured to be mounted to a vehicle in a position at least partially covering a lower surface of a passenger compartment roof, the substrate comprising an upper substrate surface and a lower substrate surface disposed opposite the upper substrate surface, and a substrate peripheral edge, the substrate comprising a moldable material, and a cavity formed into the substrate between the upper substrate surface and the lower substrate surface; the method including the steps of:

providing a blow mold having first and second opposing wall surfaces contoured to complement the exterior contours of the headliner substrate to be formed, including an enlarged region corresponding to a cavity position in the substrate to be formed;

providing a molten parison into the blow mold between said first and second opposing wall surfaces, said molten parison being formed with opposed walls;

expanding the molten parison with opposed walls into conforming contact with said first and second wall surfaces of the blow mold by injecting gas into the molten parison;

forming a headliner substrate having a cavity formed within by pinching together said first and second opposed walls of said parison at a location within said peripheral edge;

allowing the molten parison to harden;

removing the headliner substrate from the blow mold; and

providing a layer of foam on a lower surface of the substrate and providing a layer of cover material on the lower surface of the foam.

US 6,409,948 B1

PROCESS AND APPARATUS FOR THE PRODUCTION OF EXPANDED POLYESTER, IN PARTICULAR PET

Renato Crana, Turin, Italy, assignor to B.C. Foam S.r.l., Turin, Italy

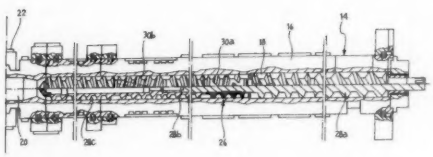
PCT No. PCT/EP98/02648, § 371 Date Jan. 10, 2000, § 102(e) Date Jan. 10, 2000, PCT Pub. No. WO98/51467, PCT Pub. Date Nov. 19, 1998

PCT Filed May 9, 1998, Appl. No. 436,754

Claims priority, application Italy, May 5, 1998, T097A0394

Int. Cl. B29C *44/20;44/46*

U.S. Cl. 264—50 **16 Claims**



1. A process for production of expanded polyester by means of extrusion from a twin screw extruder (**14**) of a polyester starting material having an intrinsic viscosity of at least 0.8 dl/g and an added expanding agent, the said process being characterised in that said twin screw extruder (**14**) is provided with two inter-penetrating screws (**26**) having a ratio between axial separation and diameter lying between 0.6 and 0.8 and co-rotating at a speed lying between 15 and 40 rpm, wherein that the length-to-diameter ratio of the screws (**26**) lies between 20 and 26.

US 6,409,949 B1

METHOD FOR THICKENING A POLYESTER RESIN

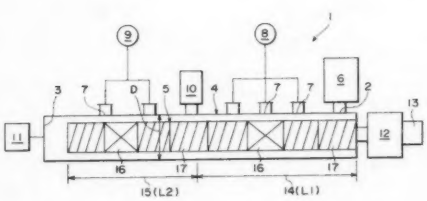
Tatsuya Tanaka, Takasago; Kazuhisa Fujisawa, Kobe; Kazuko Saka, Kobe; Tomoji Takahashi, Kobe; Koichi Fukushima, Kobe, and Yasuaki Yamane, Takasago, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho (Kobe Steel, Ltd.), Kobe, Japan

Filed Mar. 24, 2000, Appl. No. 534,394

Claims priority, application Japan, Mar. 29, 1999, 11-086274

Int. Cl. B29C *44/00*

U.S. Cl. 264—102 **20 Claims**



1. A method for thickening a polyester resin, comprising the steps of:

dehydrating a feed resin for said polyester resin under reduced pressure;

adding a chemical agent to the feed resin dehydrated in the dehydrating step, said chemical agent functioning to increase the viscosity of the feed resin or suppress a lowering in viscosity of the feed resin; and

mixing the dehydrated and chemical agent-fed feed resin while deaerating the feed resin under reduced pressure, thereby thickening the feed resin, wherein said reduced-pressure dehydrating step, chemical agent adding step, and thickening step are carried out in a single chamber.

US 6,409,950 B1

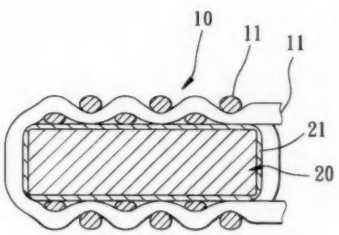
METHOD OF MAKING A HOLLOW ORNAMENTAL KNOTTED ARTICLE

Yung-Chang Chiu, No. 143, Chi-Kuang St., Taichung City, Taiwan

Filed Sep. 21, 2000, Appl. No. 668,528

Int. Cl. B29C *33/76;70/30*

U.S. Cl. 264—103 **9 Claims**



1. A method of making a hollow ornamental knotted article, comprising:

forming a thread into a loose knotting which confines thereinside a hollow space;

wrapping a solvent-soluble filler with a protective material, and inserting the wrapped filler into the hollow space;

tightening the thread so as to tie tightly the wrapped filler and adjust the loose knotting into a tight knotting;

applying a shape-setting liquid to the tight knotting so as to set a profile of the tight knotting; and

injecting a solvent into the filler through the protective material to dissolve the filler, and drawing out the dissolved filler and the protective material from the hollow space, thus forming a hollow knotted product.

US 6,409,951 B1

PROCESS FOR PRODUCING AN INORGANIC MOLDED PRODUCT

Akira Inoue, and Seitaro Onoue, both of Tokyo, Japan, assignors to Asahi Fiber Glass Company, Limited, Tokyo, Japan

Filed Mar. 30, 2000, Appl. No. 538,303

Claims priority, application Japan, Mar. 31, 1999, 11-91057; Feb. 16, 2000, 2000-38398

Int. Cl. S29C *59/00*

U.S. Cl. 264—122 **6 Claims**

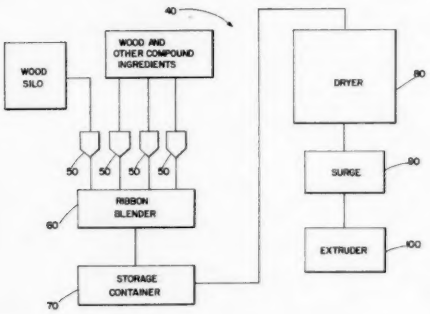
1. A process for producing an inorganic molded product, which comprises a step of preparing a hardenable composition comprising 100 parts by mass of an acid metal phosphate, from 80 to 200 parts by mass of its hardener, and from 0.1 to 10 parts by mass of urea, a step of combining 100 parts by mass of the hardenable composition and from 5 to 100 parts by mass of an inorganic reinforcing material to obtain a molding material, a step of molding the molding material into a desired shape to obtain a semi-rigid

material, and a step of heating the semi-rigid material at a temperature of at least 120° C. to complete hardening.

US 6,409,952 B1
DRYING AND PROCESSING CELLULOSIC COMPOUNDS

Wayne E. Hacker, Chillicothe; Matthew F. Kollar, Powell, and Robert W. Heigel, Pataskala, all of Ohio, assignors to Crane Plastics Company Limited Partnership, Columbus, Ohio

Provisional application No. 60/110,028, filed on Nov. 25, 1998. This application Nov. 19, 1999, Appl. No. 443,694.
Int. Cl. B29C *47/00*
U.S. Cl. 264—171.1 **13 Claims**



1. A process for drying and extruding a cellulosic compound comprised of predetermined materials, said process comprising:

providing said predetermined materials in a desired ratio, said predetermined materials including at least one thermoplastic material and a cellulosic material;

dry mixing said predetermined materials at a first location;

transferring said mixed predetermined materials to a dryer having a surface area enabling said mixed predetermined materials to be spread out over a wide surface area for drying, said dryer being at a second location remote from said first location;

substantially uniformly drying said mixed predetermined materials to a desired moisture level;

feeding said dried predetermined materials from said dryer to an extruder; and

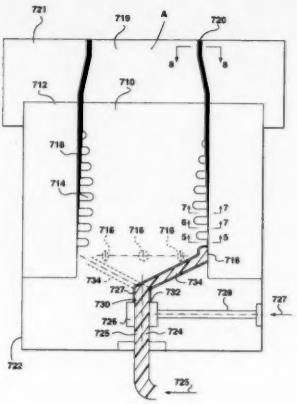
extruding said dried predetermined materials such that said at least one thermoplastic material is melt blended with said cellulosic material and forced through a shaping device to obtain a final shape.

US 6,409,953 B1
METHOD OF EXTRUDING PLASTIC MATERIAL IN MULTI-LAYER TUBULAR FORM

Mirek Planeta, and Surendra M. Sagar, both of Mississauga, Canada, assignors to Macro Engineering & Technology Inc., Mississauga, Canada

Continuation-in-part of application No. 09/082,477, filed on May 21, 1998, now Pat. No. 6,116,885. This application May 30, 2000, Appl. No. 586,559.
This patent is subject to a terminal disclaimer.
Int. Cl. B29C *47/06*
U.S. Cl. 264—171.27 **10 Claims**

1. A method of extruding plastic material in multi-layer form including: providing an extrusion die having a first body member and a second body member surrounding the first body member and forming an annular passage therebetween which communicates



with an annular extrusion orifice, said body members having a series of helical grooves extending around the die and each commencing at a separate location, said separate locations being spaced around a lower portion of the first body member,

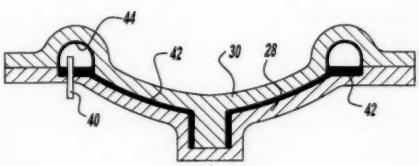
a single encapsulating unit for providing a flow of encapsulated plastic material comprising a first plastic material surrounded by a second plastic material at an outlet thereof, said first body member having a series of cross-holes extending from said outlet and each communicating with a respective separate location, and

feeding encapsulated plastic material from the outlet of the single encapsulating unit through the cross-holes to the helical grooves and subsequently to the annular passage for extrusion through the annular extrusion orifice as a multi-layer film in which the layers are inclined to and extend to the opposite surfaces of said film.

US 6,409,954 B1
METHOD OF MAKING A ROTARY MOLDED PLASTIC MEMBER WITH VARIABLE WALL THICKNESS

David C. Mulligan, Blissfield, Mich., assignor to Roto Plastics, Inc., Adrian, Mich.

Filed Oct. 5, 1999, Appl. No. 412,128
Int. Cl. B29C *41/04;41/46*
U.S. Cl. 264—255 **3 Claims**



1. A method of rotational molding a one-piece article in a rotational molding structure, said method comprising:

rotational molding an annular hollow cushion in said molding structure and then;

gravity casting in said molding structure a base member integral with said cushion and

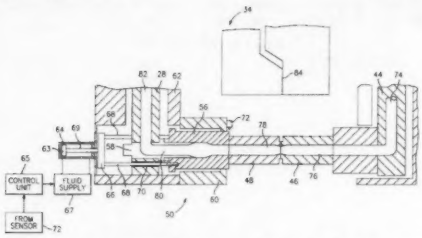
a cover member of circular shape radially inward from said cushion and said base member and integral with said base member and said cushion.

US 6,409,955 B1

SHUTHEIGHT ADJUSTER FOR A SPRUE BAR

Stefan Gunther Schmitt, Tawern, and Heinz Walter Reulecke, Saarlouis, both of Germany, assignors to Husky Injection Molding Systems Ltd., Canada

Filed Nov. 29, 1999, Appl. No. 450,793
Int. Cl. B29C *45/32*
U.S. Cl. 264—297.2 **61 Claims**



1. A sprue bar assembly for use with an injection molding machine having at least one mold, said sprue bar assembly accommodating different mold shutheights and comprising:

a fixed sprue bar section having a first channel through which molten material flows, said first channel communicating with a source o f said molten material;

means for accommodating different mold shutheights;

said accommodating means comprising at least one adjustable sprue bar section having a second channel through which molten material flows;

said at least one adjustable sprue bar section having a first position where said at least one adjustable sprue bar section is separated from said fixed sprue bar section and a second position where said at least one adjustable sprue bar section is in contact with said fixed sprue bar section; and

said accommodating means further comprising power means for moving said at least one adjustable sprue bar section relative to said fixed sprue bar section to seal said at least one adjustable sprue bar to said fixed sprue bar section and to adjust said at least one adjustable sprue bar section to accommodate different mold shutheights.

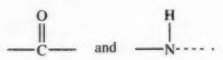
US 6,409,956 B1

INJECTION MOLDING PROCESS USING WARP-FREE PIGMENT COMPOSITIONS COMPRISING DIARYLDIKETOPYRROLO-[3,4-C]PYRROLES TO IMPROVE DIMENSIONAL STABILITY

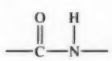
Franck Rey Flandrin, Strasbourg; Guo-Hua Hu, Nancy Cedex, both of France; Philippe Bugnon, Essert, and Zhimin Hao, Riehen, both of Switzerland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Filed Apr. 20, 1999, Appl. No. 294,484
Claims priority, application Switzerland, Apr. 22, 1998, 915/98; Mar. 2, 1999, 380/99
Int. Cl. B29C *45/00;* **C08K** *5/16;5/3445;4/3447*
U.S. Cl. 264—328.1 **14 Claims**

1. In the process of injection-molding partially crystalline plastics comprising injection molding a formulation comprising a partially crystalline plastic constituent; a pigment constituent containing at least one each of groups



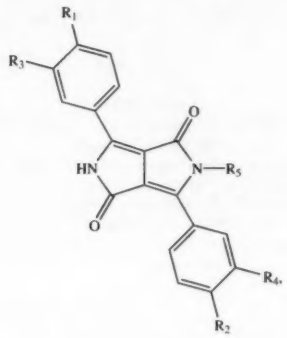
which are joined to one another as



or are in conjugation with one another; and a colorant constituent; the improvement consisting of improving the dimensional stability by using as the colorant constituent of the formulation:

from 0.01 to 1 part by weight, per part of weight of said pigment, of a colorant of the formula

(I)



in which R_1, R_2, R_3 and R_4 independently of another are hydrogen, halogen, R_6, OR_6 or SR_6, R_5 is hydrogen or linear or branched C_1–C_{12} alkyl, benzyl or phenethyl, and R_6 is an apolar group which is unsubstituted or substituted one or more times by halogen or by OC_1–C_6 alkyl, with the proviso that if R_5 is hydrogen, R_1, R_2, R_3 or R_4 is R_6, OR_6 or SR_6;

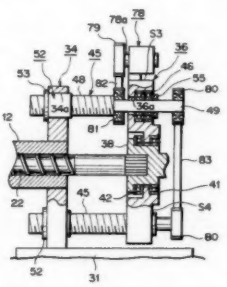
wherein the constituents of the formulation are added into an injection-molding machine for injection molding the formulation in ready-premixed form or simultaneously as individual constituents.

US 6,409,957 B1

PROCESS OF AND APPARATUS FOR INJECTION MOLDING

Noritsugu Hiraga, and Okito Nishio, both of Chiba, Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Nov. 8, 1999, Appl. No. 435,858
Claims priority, application Japan, Nov. 13, 1998, 10-323871
Int. Cl. B29C *45/00;45/50*
U.S. Cl. 264—328.1 **19 Claims**



16. A method of operating an injection apparatus including a cylinder fixed to a first support and a metering screw rotatable connected to a second support and disposed within said cylinder, the method comprising:

(a) rotating a driving pulley with a motor;

(b) rotating a screw of a first ball and screw mechanism through a belt connection from said driving pulley to a driven pulley fixed to said screw of said first ball and screw mechanism;

(c) rotating at least a screw of a second ball and screw mechanism through a transmission connected between said screw of

said first ball and screw mechanism and said screw of said second ball and screw mechanism; and

(d) moving said first support relative to said second support via forces exerted by said screw of the first ball and screw mechanism and said screw of said second ball and screw mechanism, respectively on first and second nuts disposed about said screw of said first ball and screw mechanism and said screw of said second ball and screw mechanism.

US 6,409,958 B1

METHOD OF PRODUCING BIAXIALLY STRETCHED POLYESTER FILM

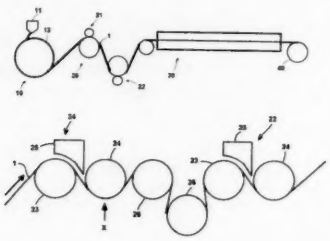
Yasuyuki Hosono; Masaaki Otoshi; Tadahiro Kegasawa; Fumitaka Terai, and Kazuo Ozaki, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 20, 2000, Appl. No. 531,216

Claims priority, application Japan, Mar. 19, 1999, 11/074831

Int. Cl. B29C *47/00*

U.S. Cl. 264—466 **6 Claims**



1. A method of producing a biaxially stretched polyester film which comprises casting a polyester cast film by extruding a molten polyester resin onto a cooling drum through a die while static electricity is applied to the extruded molten polyester resin, stretching the cast film in the longitudinal direction by stretching rolls, stretching the longitudinally stretched cast film in the lateral direction by a tenter, and heat setting the biaxially stretched cast film, wherein

said molten polyester resin having been adjusted so as to have a specific resistance of 5×10^6 to 3×10^8 Ωcm,

said die being positioned so that the line connecting the center of the cooling drum and the intersection of the vertical line passing the die lip with the circumferential surface of the cooling drum has an angle of 30 to 90 degrees against the vertical line passing the center of the drum,

said stretching in the longitudinal direction comprising a first longitudinal stretching and a second longitudinal stretching, each with heating by a far infrared heater, wherein stretching rolls in each stretching are located with a gap of 3 to 40 mm, and each far infrared heater is located with a gap of 5 to 40 mm from the circumferential surface of the stretching roll,

wherein the cast film being stretched at a draw ratio of 1.05 to 1.5 times in the first longitudinal stretching, being cooled to glass transition temperature or lower, and then being stretched again so that the total draw ratio becomes 2.5 to 3.9 times in the second longitudinal stretching,

said stretching in the lateral direction being carried out at a temperature in the range from glass transition temperature to the glass transition temperature +50° C.,

passing the laterally stretched cast film through an intermediate zone kept at said temperature in the range from glass transition temperature to the glass transition temperature +50° C. at the end of the lateral stretching +20° C. to the maximum temperature of the surface of the cast film in the tenter −20° C. for 3 to 30 seconds, and

said heat setting being carried out at a temperature from melting point −30° C. to melting point −5° C.

US 6,409,959 B1

PROCESS FOR MANUFACTURING, MOULDING AND CURING TIRES FOR VEHICLE WHEELS

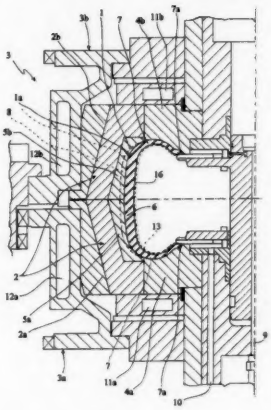
Renato Caretta, Gallarate, and Cristiano Bette', Milan, both of Italy, assignors to Pirelli Pneumatici S.p.A., Milan, Italy

Provisional application No. 60/108,887, filed on Nov. 17, 1998, Provisional application No. 60/124,523, filed on Mar. 16, 1999. This application Jul. 30, 1999, Appl. No. 365,231.

Claims priority, application European Pat. Off., Jul. 31, 1998, 98830473.9; Nov. 20, 1998, 98830696.5

Int. Cl. B29C *35/00*

U.S. Cl. 264—501 **12 Claims**



1. A process for manufacturing, moulding, and curing a tire, comprising the steps of:

manufacturing a green tire comprising a first elastomer material;

providing an inner surface of the tire with a treatment to prevent permeation of a fluid under pressure through the treatment;

closing the tire into a moulding cavity defined in a vulcanization mould, the moulding cavity including at least one wall;

admitting a fluid under pressure into a space defined by the treatment in order to press an outer surface of the tire against the at least one wall of the moulding cavity; and

applying heat to the tire to vulcanize the first elastomer material;

wherein a shape of the at least one wall of the moulding cavity matches a shape of the outer surface of the tire after vulcanization is complete,

wherein the treatment comprises at least one layer comprising a second elastomer material, and

wherein vulcanization of the second elastomer material only takes place when the second elastomer material is brought into contact with a sulfur-containing vulcanizable mixture constituting an innermost layer of the tire.

US 6,409,960 B1

METHODS OF MANUFACTURING GOLF CLUB SHAFTS

Thomas W. Preece, San Diego, and Herb Reyes, Laguna Niguel, both of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

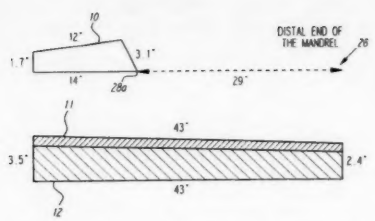
Continuation of application No. 08/918,961, filed on Aug. 26, 1997, now Pat. No. 6,126,557. This application Apr. 25, 2000, Appl. No. 559,162.

Int. Cl. B29C *49/20;43/10;70/44*

U.S. Cl. 264—516 **8 Claims**

1. A method of manufacturing a shaft for a golf club, the method comprising:

providing a mandrel having a proximal and a distal tip, wrapping a plurality of plies of pre-preg composite sheet around the mandrel and wrapping at least one ply of loaded film comprising a weighting agent around the mandrel starting at a



point from between 19.5 inches to 29 inches from the distal tip in a predetermined manner, and

heating the wrapped mandrel at a temperature from between 250° to 800° F. for up to 1.5 hours to allow a resin comprising the plies of pre-preg composite sheet and loaded film to cure.

US 6,409,961 B1

TITANIA FIBER, METHOD FOR PRODUCING THE FIBER AND METHOD FOR USING THE FIBER

Hironobu Koike; Yasuyuki Oki, and Yoshiaki Takeuchi, all of Niihama, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

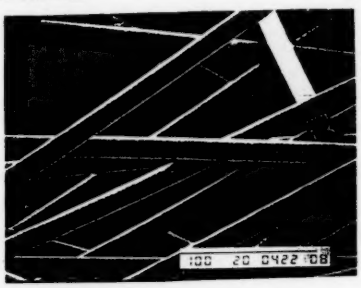
Division of application No. 08/999,334, filed on Dec. 29, 1997, now Pat. No. 6,086,844. This application Mar. 10, 2000, Appl. No. 523,461.

Claims priority, application Japan, Dec. 26, 1996, 8-348930; Mar. 26, 1997, 9-073713; Apr. 25, 1997, 9-109627

This patent is subject to a terminal disclaimer.

Int. Cl. C04B *35/46*

U.S. Cl. 264—623 **25 Claims**



1. A method for producing a continuous fiber of titania, which comprises:

(i) adding water to an alcohol solution of a titanium alkoxide to carry out a hydrolysis reaction and a polymerization reaction of the titanium alkoxide;

(ii) forming and depositing a polymer which is insoluble in the alcohol;

(iii) dissolving the polymer in the presence of an organic solvent in which the polymer dissolves to form a spinning solution;

(iv) spinning the spinning solution to obtain a precursor fiber; and

(v) calcining the precursor fiber to obtain said continuous fiber.

US 6,409,962 B1

POWDER INJECTOR FOR LADLE

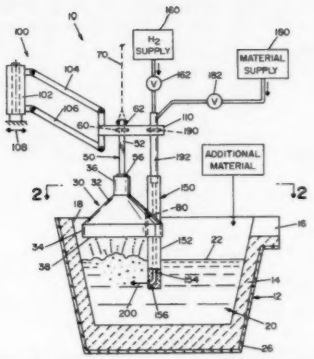
Paul D. Lawson, Moon Township, Pa., assignor to Rossborough Manufacturing Co., Avon Lake, Ohio

Filed Oct. 2, 2000, Appl. No. 678,292

Int. Cl. C21C *7/00*

U.S. Cl. 266—216 **14 Claims**

1. A powder injector for use with a ladle of molten metal having an exposed upper surface, said injector comprising a splash deflector with a cast body of heat resistant material having a downwardly facing lower surface with an outer periphery, an elongated powder injection lance having a tubular body extending vertically adjacent said outer periphery from above said deflector to a position substantially below said upper surface, said lance having an outlet nozzle directed at a transverse angle to said tubular body in a direction inwardly of said outer periphery and below said lower surface of said splash deflector, and means for mounting said lance and said splash deflector in relation to said ladle.



US 6,409,963 B1

METALLURGIC CONTAINER

Hans-Werner Gohres, Duisburg; Franz-Josef Divjak, Rheinberg, and Norbert Asmus, Moers, all of Germany, assignors to Mannesmannröhen-Werke AG, Mülheim, Germany

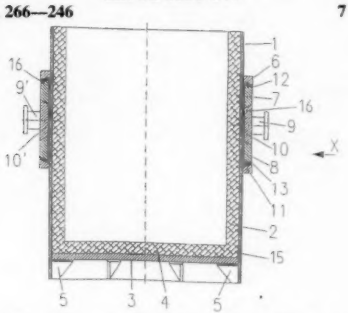
PCT No. PCT/DE99/02585, § 371 Date Mar. 30, 2001, § 102(e) Date Mar. 30, 2001, PCT Pub. No. WO00/10754, PCT Pub. Date Mar. 2, 2000

PCT Filed Aug. 13, 1999, Appl. No. 763,296

Claims priority, application Germany, Aug. 12, 1998, 199 38 202; Aug. 13, 1999, 198 38 365

Int. Cl. C21C *5/50*

U.S. Cl. 266—246 **7 Claims**



1. A metallurgic vessel, comprising: an upwardly open container which has a bottom and a metal casing; a refractory lining provided in the container; a unitary carrying framework including carrying means for carrying the container arranged on an outside of the metal casing, two carrying rings located at a parallel distance from one another and running in a circumferential direction and two vessel carrying lugs located opposite one another, plates being connected to the carrying rings and a respective one of the lugs being attached to each of the plates, the carrying rings together with the plates and the vessel carrying lugs form an independent unit which is at a distance from the outside of the metal casing and is arranged with play between the carrying means; at least two claws located opposite one another and fixed in an upper region of the metal casing for receiving the carrying framework; and a demountable and a mountable securing ring arranged to surround

the metal casing for supporting an underside of the carrying framework so that the container is removable by demounting only the securing ring.

US 6,409,964 B1

COLD BONDED IRON PARTICULATE PELLETS

Jay Aota, Kanata, and Lucie Morin, Gatineau, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Natural Resources, Ottawa, Canada

Filed Nov. 1, 1999, Appl. No. 431,263
Int. Cl. B22F *3/22*
U.S. Cl. 419—19 **23 Claims**

1. A method of making cold bonded shaped bodies containing iron particulate material, including the steps of:

(a) mixing together to provide a substantially homogenous dry mixture from about 70% to about 97% of an iron particulate material having a size of less than about 6 mm, and from about 3% to about 30% of particulate high-alumina cement binder;

(b) adding to the mixture from step (a) at least sufficient water to fully hydrate the high-alumina cement;

(c) converting the mixture from step (b) into a homogenous mixture;

(d) converting the mixture from step (c) into green shaped bodies; and

(e) curing the shaped bodies.

US 6,409,965 B1

SPUTTERING TARGET AND ITS MANUFACTURING METHOD

Takahiro Nagata; Manabu Sasaki; Hitoshi Kimura, and Norio Yokoyama, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 21, 2000, Appl. No. 666,241
Claims priority, application Japan, Sep. 21, 1999, 11-267136
Int. Cl. C22C *32/00;1/00;14/34;* **B22F** *1/00*
U.S. Cl. 419—26 **9 Claims**

1. A method for manufacturing a sputtering target, the method comprising:

presenting an alloy powder which contains at least 65 weight percent of at least one rare earth alloy powder, wherein the at least one rare earth alloy powder comprises at least one rare earth element, at least two elements selected from the group consisting of Fe, Co, Ni, Cr and Si, and at least one recycled alloy powder prepared by using a target used at least once for sputtering;

melting the alloy powder; and

atomizing the melted alloy powder, wherein the alloy powder includes no more than 0.1 weight percent metal impurities from a crushing member.

US 6,409,966 B1

FREE MACHINING ALUMINUM ALLOY CONTAINING BISMUTH OR BISMUTH-TIN FOR FREE MACHINING AND A METHOD OF USE

Subhasish Sircar, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of application No. 08/081,452, filed on May 19, 1998, now Pat. No. 6,065,534, Provisional application No. 60/144,255, filed on Jul. 19, 1999. This application May 23, 2000, Appl. No. 576,813.
Int. Cl. C22C *21/00*
U.S. Cl. 420—530 **14 Claims**

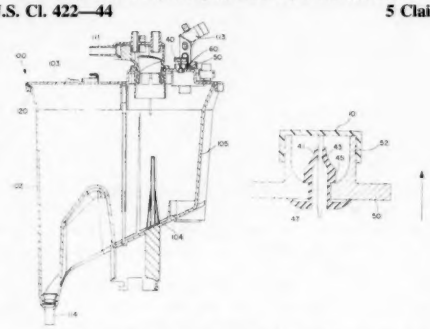
1. In a free machining aluminum alloy having a free machining constituent as a part thereof, the improvement comprising employing bismuth as a sole free machining constituent in an AA6000 series aluminum alloy, the amount of bismuth between about 0.1 and 1.7% by weight.

US 6,409,967 B1

VALVE OBTURATOR

Kevin D. McIntosh, Albertville, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 6, 1998, Appl. No. 187,781
Int. Cl. A61M *1/14;5/178;* **A61L** *2/00;* **F16K** *11/00;7/04*
U.S. Cl. 422—44 **5 Claims**



1. A method for preventing self-adhesion of the tips of a duck-bill valve during sterilization comprising:

providing an obturator having a plunger element;

inserting the plunger element between the tips of a duck-bill valve prior to sterilization;

sterilizing the duck-bill valve;

removing the plunger element of the obturator from the duck-bill valve before use of the duck-bill valve; and

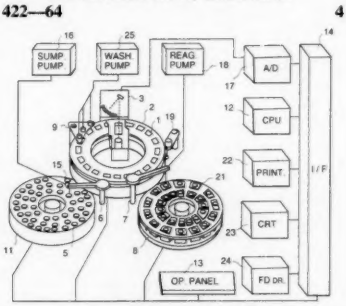
using the duck-bill valve.

US 6,409,968 B1

AUTOMATIC ANALYSIS APPARATUS FOR BIOLOGICAL FLUID SAMPLE AND AUTOMATIC ANALYSIS METHOD THEREFOR

Katsuaki Takahashi, Hitachinaka, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 4, 1999, Appl. No. 433,718
Claims priority, application Japan, Nov. 5, 1998, 10-314795
Int. Cl. B32B *27/04;* **G01N** *21/00*
U.S. Cl. 422—64 **4 Claims**



1. An automatic analysis apparatus comprising a sample transfer device for transferring a sample container so as to pass through a sample sampling position; a reaction disk having a plurality of reaction containers; and a pipetter device for pipetting a sample to be analyzed into the reaction container on said reaction disk, and performing operation of analyzing the sampled sample, which comprises

a control unit for controlling motion of said pipetter device so that the sample to be analyzed is pipetted from the sample container stopped at the sample sampling position into the same number of the reaction containers as number of analysis items pre-scheduled to be analyzed and at least one backup reaction container, wherein

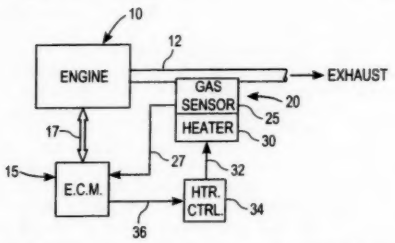
said control unit controls motion of said pipetter device so as to hold a backup sample in said backup reaction container until a result of a first analysis in regard to the sample to be analyzed is obtained and to pipette part of the backup sample in said backup reaction container into another reaction container for re-analysis.

US 6,409,969 B1

SYSTEM AND METHOD FOR CONTROLLING A SELF-HEATED GAS SENSOR BASED ON SENSOR IMPEDANCE

Steven R. Streicher, Cincinnati, Ohio; James A. Freeman, Antioch, Ill., and John E. Taylor, Columbus, Ind., assignors to Cummins, Inc., Columbus, Ind.

Filed Jun. 1, 1999, Appl. No. 323,199
Int. Cl. G01N *31/12*
U.S. Cl. 422—94 **25 Claims**



1. A gas sensor system for use in an internal combustion engine, comprising:

a gas sensor having a sensing element for detecting a gas and operable to generate a gas level signal at an output of said sensor;

a heating element adjacent said gas sensor operable to generate a continuously variable amount of heat for warming said sensing element in response to variable power applied to said heating element;

an impedance sensor connected to said output of said sensing element and having circuitry generating an impedance signal as a function of the impedance of said sensor element; and

control means, connected between said impedance sensor and said heating element, for continuously varying the power applied to said heating element as a function of said impedance signal.

US 6,409,970 B1

BIOPSY COLLECTION SYSTEM

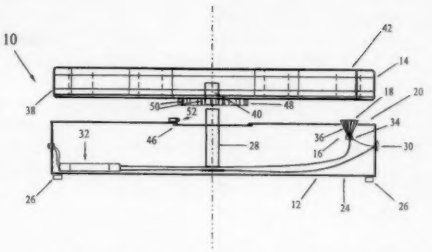
Christopher R. Phifer, 1460 Allentown Rd., Lansdale, Pa. 19446

Filed Dec. 18, 2000, Appl. No. 739,434
Int. Cl. G01N *1/28*
U.S. Cl. 422—102 **14 Claims**

1. A biopsy collection device for use in safely securing and positively visualizing a biopsy specimen located in a specimen container, comprising:

a base unit housing a light source directing light upwardly through said base unit; and

a carrousel mounted on said base unit and rotatable relative to said base unit, said carrousel having a plurality of securement means each for positively and safely securing a specimen container to said carrousel such that rotation of said carrousel



relative to said base unit positions at least a selected one of said securement means in a position for illumination by said light source thereby aiding the visualization of a biopsy specimen located in the specimen container secured by said securement means;

said plurality of specimen container securement means being a plurality of spaced-apart, upwardly-opening recesses formed in the carrousel, each recess for use in positively holding a single specimen container; and

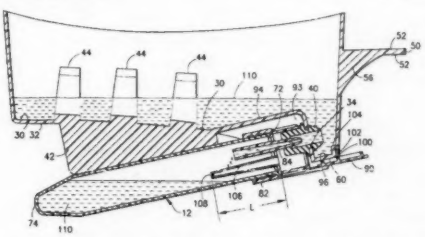
said carrousel having a multi-layer construction including a horizontally-disposed light diffusing layer, a horizontally disposed rubber gasket layer spaced above said light diffusing layer by at least one horizontally disposed spacing layer having apertures defining said plurality of recesses of said carrousel, and at least one overlay layer forming an upper surface of said carrousel and having apertures which are vertically aligned with said apertures of said spacing layer, said rubber gasket layer having slotted openings within each recess.

US 6,409,971 B1

DEVICE AND METHOD FOR COLLECTING AND TRANSFERRING A URINE SPECIMEN

Bradley M. Wilkinson, North Haledon, and Robert S. Golabek, Jr., Towaco, both of N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 6, 1999, Appl. No. 369,728
Int. Cl. B01L *3/00*; **A61B** *5/00*
U.S. Cl. 422—103 **6 Claims**



1. A method for collecting and transferring a urine specimen comprising the steps of:

holding a urine collection device having an arcuate base, an open top defining a plane, and a side wall extending from said base to said open top, said base having an inclined top surface, a bottom surface and a conduit passing through said top surface and said bottom surface, said device further Including a valve angularly attached and recessed in said base such that said valve is in fluid communication with said conduit and said base, said device further having a finger placement platform horizontally mounted on said side wall and having a gripping surface such that said gripping surface is perpendicularly and horizontally oriented from said side wall, said urine collection device being held by said finger placement platform;

collecting the specimen in said urine collection device;

attaching a collection tube having a blunt cannula to puncture said valve such that said tube is positioned and attached at an oblique angle to said base relative to said plane for filling said collection tube to a predetermined volume, when said device is placed on a level surface,

transferring the specimen into said collection tube at a predetermined volume;

tilting said device in a direction parallel to said tube and away from said valve so that said inclined top area stops the specimen flow toward said valve; and

removing said collection tube from said device.

US 6,409,972 B1

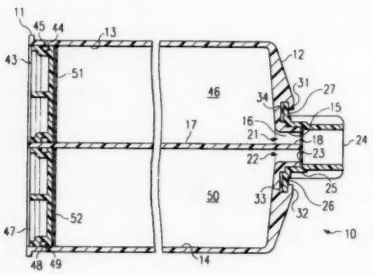
PREPACKAGED LIQUID BONE CEMENT

Kwan-Ho Chan, 4803 First Pl., Lubbock, Tex. 79416

Filed Jun. 6, 1995, Appl. No. 467,619

Int. Cl. B67D *5/52;* **A61K** *6/08;* **B01F** *13/06;15/02*

U.S. Cl. 422—131 **20 Claims**



1. A bone cement preparation system for providing a liquid bone cement having a first monomer/polymer ratio, said system comprising a container having a first end and a second end, said container having a first chamber and a second chamber located between said first and second ends, each of said first and second chambers having an outlet in said second end of said container, said container being free of internal communication between said first chamber and said second chamber;

said first chamber containing a first liquid component for said liguid bone cement, said first liquid component comprising a liquid alkyl methacrylate, poly(alkyl methacrylate), a polymerization initiator, and a stabilizer for preventing spontaneous polymerization of the liquid alkyl methacrylate in said first liquid component, the liquid alkyl methacrylate being present in said first liquid component in an amount which is at least sufficient to provide the first liquid component as a liquid mixture, said first chamber being at least substantially free of air;

said second chamber containing a second liquid component for said liquid bone cement, said second liquid component comprising a liquid alkyl methacrylate, an activator, and a stabilizer for preventing spontaneous polymerization of the liquid alkyl methacrylate in said second liquid component, the liquid alkyl methacrylate being present in said second liquid component in an amount which is at least sufficient to provide the second liquid component as a liquid mixture, said second chamber being at least substantially free of air.

US 6,409,973 B1

EXHAUST GAS PURIFICATION DEVICE FOR AN ENGINE

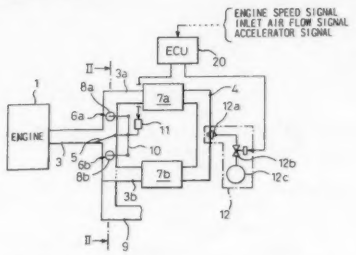
Yukio Kinugasa; Toshifumi Takaoka; Kouhei Igarashi, all of Susono, and Takaaki Itou, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 5, 1995, Appl. No. 523,455

Claims priority, application Japan, Sep. 16, 1994, 6-221624

Int. Cl. B01D *53/14;53/34;* **F01N** *3/10*

U.S. Cl. 422—171 **2 Claims**



1. An exhaust gas purification device for an internal combustion engine which has an exhaust passage, the engine being operated at an air-fuel ratio higher than a stoichiometric air-fuel ratio, the device comprising:

a first NOx absorbent bed and second NOx absorbent bed disposed in an exhaust passage of an engine and connected to each other in series by an exhaust connecting passage, each of the NOx absorbent beds absorbing NOx components in an exhaust gas when an air-fuel ratio of the exhaust gas flowing into the NOx absorbent beds is lean, and releasing absorbed NOx components when an oxygen concentration in the exhaust gas becomes lower than a predetermined amount;

a reducing agent supply means for supplying a reducing agent into the exhaust gas in the exhaust connecting passage between the first and the second NOx absorbent beds;

a switching means for switching the direction of the exhaust gas flow between a first direction in which the exhaust gas flows through the first NOx absorbent bed to the exhaust connecting passage and into the second NOx absorbent bed in this order, and a second direction in which the exhaust gas flows through the second NOx absorbent bed to the exhaust connecting passage and into the first NOx absorbent bed in this order; and

a control means for controlling the switching means so that the direction of the exhaust gas flow is switched between the first and second direction.

US 6,409,974 B1

WATER GAS SHIFT PROCESS AND APPARATUS FOR PURIFYING HYDROGEN FOR USE WITH FUEL CELLS

Gavin P. Towler, Barrington, and Kurt Vanden Bussche, Lake in the Hills, both of Ill., assignors to UOP LLC, Des Plaines, Ill.

Filed Dec. 11, 1998, Appl. No. 210,306

Int. Cl. B01D *50/00;* **B01J** *10/00;8/02*

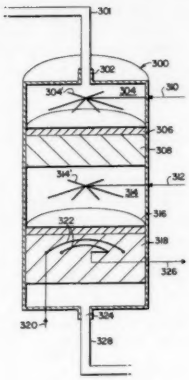
U.S. Cl. 422—172 **8 Claims**

1. An apparatus for a compact water gas shift reaction zone for removing carbon monoxide from a hydrogen stream in the production of electric power from a fuel cell, said apparatus comprising:

a) a vertically aligned vessel having a top end, a bottom end opposite, and defining an interior space, said vertically aligned cylindrical vessel defining a shift inlet the top end, and a shift outlet at the bottom end;

b) a first water spray nozzle in communication with a first water supply conduit and located within said interior space for contacting the hydrogen stream with a first water stream;

c) a first dispersion material retained in said interior space disposed below said first water spray nozzle to define the bottom of a first water spray zone, said first dispersion mate-



rial defining a first dispersion zone disposed directly on a high temperature shift reaction zone, which is the high temperature shift reaction zone closest to the top end of the vessel, said first dispersion zone being in fluid communication with said water spray zone to disperse the first water stream into the hydrogen stream toward the foist dispersion zone;

d) a first fluid permeable portion defining a bottom of the high temperature shift reaction zone in the interior space disposed below the first dispersion zone and in fluid communication with the first dispersion zone, said high temperature shift zone containing a high temperature shift catalyst to produce a high temperature shift effluent stream;

e) a second water spray zone in fluid communication with the high temperature shift reaction zone and defined by a portion of the interior space disposed below the high temperature shift reaction zone, the second water spray zone containing a second water spray nozzle in fluid communication with a second water supply conduit to contact the high temperature shift effluent stream with a second water stream;

f) a second dispersion zone material retained in the interior space below said second water spray zone in fluid communication with the second water spray zone to define a second dispersion zone disposed directly on a low temperature shift zone for dispersing the second water spray stream into the high temperature shift effluent stream toward the second dispersion zone; and,

g) the low temperature shift zone in fluid communication with the second dispersion zone defined by a portion of the interior space below the second dispersion zone and above said shift outlet, said low temperature shift zone containing a low temperature shift catalyst to produce a water saturated hydrogen product stream.

US 6,409,975 B1

ELECTROHYDRODYNAMIC INDUCTION PUMPING THERMAL ENERGY TRANSFER SYSTEM AND METHOD

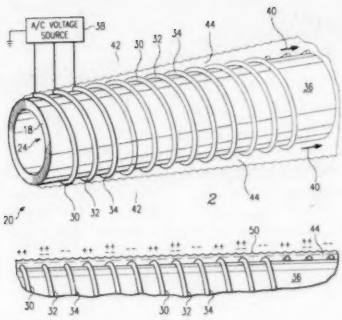
Jamal Seyed-Yagoobi, College Station, Tex., and Markus Wawzyniak, Stuttgart, Germany, assignors to The Texas A&M University System, College Station, Tex.

Provisional application No. 60/135,420, filed on May 21, 1999. This application May 19, 2000, Appl. No. 574,007.

Int. Cl. B01J *19/08*

U.S. Cl. 422—186 **41 Claims**

15. In a thermal energy transfer system comprising a heat transfer member having separate first and second surfaces each being configured to be subjected to separate first and second temperatures, at least one of the first and second surfaces also being configured to be subjected to a fluid so that a liquid phase of the fluid is present on the at least one of the first and second surfaces, the improved method comprising:



providing a plurality of separate electrical conductors extending coextensively with an axial length of the heat transfer member and at least partially around the circumference thereof;

providing an electric multi-phase alternating power source having multiple terminals and producing a number of phases corresponding to a number of the multiple terminals;

coupling each of the multiple electrical conductors to a different one of the multiple terminals so that an electric traveling wave moves in a longitudinal direction of the heat transfer member to induce pumping of at least the liquid phase in the longitudinal direction to thereby enhance the thermal energy transfer characteristics of the thermal energy transfer system.

US 6,409,976 B1

REACTOR WITH POROUS HOLLOW FIBERS FOR CHEMICAL REACTIONS

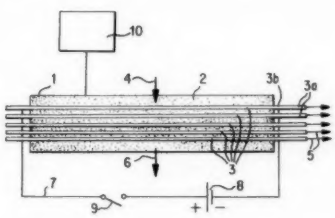
Thomas Poschmann, Ulm, and Steffen Wieland, Stuttgart, both of Germany, assignors to DaimlerChrysler AG, Stuttgart, Germany

Filed Feb. 4, 1999, Appl. No. 244,121

Claims priority, application Germany, Feb. 4, 1998, 198 04 286

Int. Cl. F28D *21/00;* **B01J** *8/02*

U.S. Cl. 422—199 **9 Claims**



1. A reactor for the catalytic chemical reaction of a gaseous or liquid reaction starting product to a reaction end product that contains a gaseous or liquid reaction constituent which can be selectively separated by means of membrane diffusion, comprising:

a reaction space into which the reaction starting product flows;

a catalyst material disposed in the reaction space;

porous hollow fibers disposed in the reaction space, said porous hollow fibers being made of a material which is selectively permeable to said gaseous or liquid reaction constituent, for separation of the gaseous or liquid reaction constituent from the reaction end product by diffusion thereof through walls of said porous hollow fiber, from said reaction space into an interior space of said porous hollow fibers;

a metallic coating on each of the porous hollow fibers;

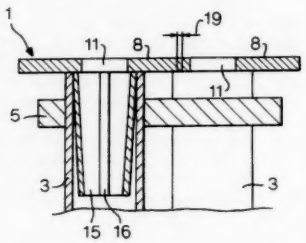
a device that heats the porous hollow fibers during a starting phase to an operating temperature at which selective diffusion of the reaction end product occurs by applying an electric voltage to the metallic coatings; and

a separate heat source that heats the catalyst material in the reaction space.

US 6,409,977 B2
REACTOR TUBE LOADING DEVICE

Jamie Stewart Harper, and Karl Barry Thew, both of Scunthorpe, United Kingdom, assignors to Shell Oil Company, Houston, Tex.

Filed May 11, 1999, Appl. No. 309,924
Claims priority, application European Pat. Off., May 12, 1998, 98303681
Int. Cl. B01J *8/08;* **F27B** *15/08;* **B65B** *1/06*
U.S. Cl. 422—232 **11 Claims**



1. A loading device for loading solid particles into a multi- tube reactor in which a plurality of reactor tubes are substantially vertical and held together by an upper and a lower tube sheet, the loading device comprising a plurality of adjacent polygonal plates, each polygonal plate having from 1 to 30 holes, each hole corresponding to one reactor tube of said plurality of reactor tubes, each hole having a diameter not greater than 95% of the inner diameter of its corresponding reactor tube and not smaller than 1.1 times the greatest dimension of a single particle to be loaded into said corresponding reactor tube, the polygonal plates also comprising means for holding the holes in correspondence with the respective reactor tubes; wherein each plate rests on the upper tube sheet; and wherein each plate is displaced from adjacent plates by an inter-plate spacing having a width not greater than the smallest dimension of a single particle to be loaded into said reactor, said inter-plate spacing for collecting dust and partial particles.

US 6,409,978 B1
METHOD OF REMOVING IMPURITIES FROM MINERAL CONCENTRATES

Bobby P. Faulkner, New Berlin, and John M. Paustian, Milwaukee, both of Wis., assignors to Svedala Industries, Inc., Waukesha, Wis.

Continuation-in-part of application No. 09/053,184, filed on Apr. 1, 1998, now Pat. No. 6,090,353. This application Jul. 13, 2000, Appl. No. 615,212.
This patent is subject to a terminal disclaimer.
Int. Cl. C01B *25/10;25/26;33/20;33/26;33/12*
U.S. Cl. 423—1 **22 Claims**

1. A process for removing impurities contained in the crystal lattice in minerals, comprising the steps of:

forming a mixture of a mineral capable of structurally reorganizing its crystal lattice which contains an impurity in its crystal lattice, a halogen anion, water and a matrix-forming additive to facilitate the migration of the impurity from said crystal lattice, said matrix-forming additive is selected from the group consisting of a silicate, a kaolinite clay, a lignosulfonate, a starch and a starch hydrolyzate;

heating the mixture to at least the structural reorganization transition temperature of said mineral;

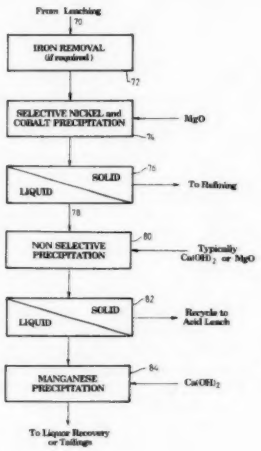
holding the mixture at the structural reorganization transition temperature for a sufficient amount of time to freely migrate the impurity from the crystral lattice and combine with the halogen anion and matrix-forming additive; and

separating the combined impurity, matrix-forming additive and anion from said mixture to render the mineral essentially free of said impurity.

US 6,409,979 B1
SELECTIVE PRECIPITATION OF NICKEL AND COBALT

David Thomas White, Yangebup, Australia, assignor to Centaur Nickel Pty Limited, South Melbourne, Australia

PCT No. PCT/AU98/00583, § 371 Date Apr. 7, 2000, § 102(e) Date Apr. 7, 2000, PCT Pub. No. WO99/06603, PCT Pub. Date Feb. 11, 1999
PCT Filed Jul. 23, 1998, Appl. No. 462,106
Claims priority, application Austria, Aug. 1, 1997, P0 8371
Int. Cl. C22B *23/00;47/00*
U.S. Cl. 423—140 **19 Claims**



1. A method for precipitating nickel and cobalt from an acid aqueous solution containing at least dissolve nickel, cobalt an manganese, the method including the steps of:

(a) determining amounts of nickel, cobalt and manganese in the acid aqueous solution;

(b) determining an amount of magnesium oxide required to effect precipitation of a substantial proportion of the nickel and cobalt in solution and to effect precipitation of a minor proportion of the manganese in solution to form a solid precipitate including nickel, cobalt and manganese such that a weight ratio of (Ni+Co)/ in the solid precipitate is at least five times larger than a weight ratio of (Ni+Co)/Min in the acid aqueous solution;

(c) adding the determined amount of magnesium oxide, in the form of solid caustic calcined magnesium oxide or freshly slurred magnesium oxide, to the aqueous solution;

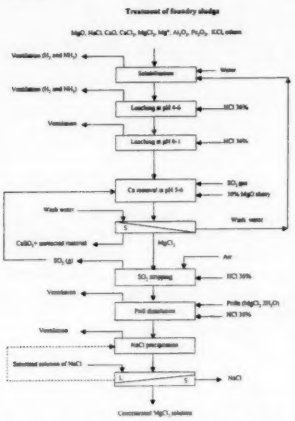
(d) maintaining the magnesium oxide in contact with the acid aqueous solution for a period of from about 1 hour to about 9 hour to thereby achieve precipitation of the substantial proportion of the nickel and cobalt in solution and the minor proportion of the manganese in solution such that the weight ratio of (Ni+Co)/Mn in the solid precipitate is at least five times larger than the weight ratio of (Ni+Co)/Mn in the acid aqueous solution supplied to step (c); and

(e) separating a mixture from step (d) into precipitated solids and a liquor.

US 6,409,980 B1
PROCESS AND APPARATUS FOR TREATING FOUNDRY SLUDGE TO RECOVER MAGNESIUM

Carl W. White, Danville; Jean Guimont, Québec; Denys Pinard, Asbestos, and Serge Monette, Longueuil, all of Canada, assignors to Noranda, Inc., Tornton, Canada

Filed Jun. 16, 2000, Appl. No. 594,490
Int. Cl. C01F *5/00;* **C22B** *26/00*
U.S. Cl. 423—155 **39 Claims**



1. A method for recovering a concentrated magnesium chloride solution from a magnesium-containing material, comprising the steps of:

dissolving, in a water slurry, a magnesium-containing material comprising magnesium, calcium, NaCl, SO_2, and solids;

performing a first step for acidifying the water slurry to between substantially pH 4 and substantially pH 6;

performing a second step for acidifying the water slurry to between substantially pH 1 and substantially pH 0, thereby providing a magnesium chloride solution;

precipitating calcium from the magnesium chloride solution;

separating solids from the magnesium chloride solution;

stripping SO_2 from the magnesium chloride solution; and

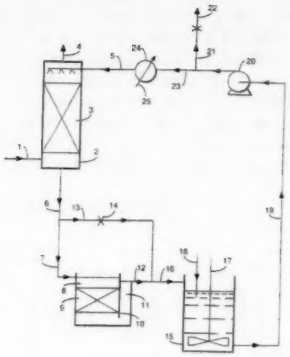
precipitating NaCl from the magnesium chloride solution, thereby providing a concentrated magnesium chloride solution.

US 6,409,981 B1
PROCESS FOR REMOVING CHLORINE FROM GAS STREAM

Edmund Hugh Stitt, and Frederick Ernest Hancock, both of Cleveland, United Kingdom, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Continuation of application No. PCT/GB97/03175, filed on Nov. 19, 1997, Provisional application No. 60/045,013, filed on Apr. 25, 1997. This application Jun. 10, 1999, Appl. No. 329,412.
Int. Cl. B01D *53/68*
U.S. Cl. 423—241 **10 Claims**

1. A process for the scrubbing of chlorine from a chlorine-containing gas comprising contacting said gas with an aqueous feed liquor containing an excess of alkali over that required to react with the chlorine in the gas whereby said chlorine is scrubbed from the gas to provide an effluent liquor containing chloride and hypochlorite ions resulting from the reaction of said chlorine gas with said alkali, and passing at least part of said effluent liquor through a fixed bed of a catalyst for the decomposition of hypochlorite ions whereby hypochlorite ions in said at least part of the effluent liquor are decomposed to oxygen gas and chloride ions to give a treated liquor containing a decreased concentration of hypochlorite ions, characterised in that, for at least part of the time



while said gas is being contacted with said aqueous feed liquor, at least part of said treated liquor is recycled as at least part of the aqueous feed liquor.

US 6,409,982 B1
PROCESS FOR PRODUCTION OF POTASSIUM CARBONATE SESQUIHYDRATE

William J. Zuccarello, Cream Ridge, N.J.; Elliot Block, Yardley, Pa.; Joseph A. Paluzzi, Hightstown, and Kenneth R. Cummings, Skillman, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Jan. 18, 2001, Appl. No. 764,920
Int. Cl. C01D *7/00*
U.S. Cl. 423—421 **7 Claims**

1. A process for producing crystalline potassium carbonate sesquihydrate ($K_2CO_3.1.5\ H_2O$) which comprises admixing particulate anhydrous potassium carbonate with a 20–60 weight percent aqueous solution of potassium carbonate at a temperature between about 50°–210° F. at a rate between about 3–8 pounds of solution per pound of anhydrous potassium carbonate per minute of addition, until stoichiometric hydration of the anhydrous potassium is achieved; wherein the resultant potassium carbonate sesquihydrate product has at least about 90 percent particle size distribution in the range between about 200–1500 microns.

US 6,409,983 B1
PROCESS FOR PREPARING CRYSTALLINE BARIUM TITANATE POWDER

Guang Jin Choi; Kyungja Woo; Young Sang Cho; Sang Jun Sim; Young Dae Kim, all of Seoul, and Sang Kyun Lee, Euijeongbu, all of Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed Jul. 11, 2000, Appl. No. 614,160
Int. Cl. C01G *23/00;* **C01F** *1/00*
U.S. Cl. 423—598 **5 Claims**

1. A process for preparing crystalline barium titanate powder comprising: preparing a sol precursor by mixing a titanate acylate and a barium compound, wherein said titanium acylate is prepared by a liquid substitution reaction between a titanium alkoxide and about 4 to 7 equivalents of acetic acid per equivalent of said titanium alkoxide, and said barium compound is selected from the group consisting of barium chloride, barium acetate, barium nitrate and barium hydroxide; spraying the thereby produced sol precursor with an alkaline solution having a pH of greater than 14 effectuating coprecipitation; and, thereby, simultaneously crystallizing, without a hydrothermal reaction, a highly crystalline barium titanate powder; and purifying said barium titanate powder by washing with a dilute aqueous ammonia solution or a dilute aqueous barium hydroxide solution.

US 6,409,984 B1

SPINEL-TYPE LITHIUM MANGANESE COMPLEX OXIDE FOR A CATHODE ACTIVE MATERIAL OF A LITHIUM SECONDARY BATTERY

Koji Hattori, and Yasuhisa Yamashita, both of Shiga-ken, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 17, 1997, Appl. No. 877,260

Claims priority, application Japan, Jun. 17, 1996, 8-155677; Aug. 29, 1996, 8-228794; Dec. 3, 1996, 8-322967; Apr. 9, 1997, 9-090805

Int. Cl. C01D *15/00;* **C01G** *45/00;* **H01M** *4/50*

U.S. Cl. 423—599 **12 Claims**

1. A process for producing a spinel lithium manganese complex oxide for a cathode active material of a lithium secondary battery, which comprises the steps of:

a) atomizing and pyrolyzing a composition which consists essentially of an aqueous or alcohol solution of nitrate, acetate or formate of metal elements constituting a spinel lithium manganese complex oxide at a temperature between 500 and 900° C. to obtain a spinel lithium manganese complex oxide by atomizing said solution into a heated atmosphere, and

b) annealing said spinel lithium manganese complex oxide at a temperature between about 600 and 850° C. for a time sufficient to increase the average particle diameter thereof to between about 1 and 5 micrometers and adjust the specific surface area thereof to between about 2 and 10 m^2/g.

US 6,409,985 B1

METHOD FOR PRODUCING LITHIUM MANGANATE

Koichi Numata, and Hiromu Shinkawa, both of Hiroshima, Japan, assignors to Mitsui Mining and Smelting Company, Ltd., Tokyo, Japan

PCT No. PCT/JP99/04811, § 371 Date Jun. 13, 2000, § 102(e) Date Jun. 13, 2000, PCT Pub. No. WO00/32518, PCT Pub. Date Jun. 8, 2000

PCT Filed Sep. 6, 1999, Appl. No. 581,428

Claims priority, application Japan, Dec. 2, 1998, 10-343239

Int. Cl. C01D *15/00;* **C01G** *45/00*

U.S. Cl. 423—599 **2 Claims**

1. A process for producing lithium manganate, comprising pulverizing electrodeposited manganese dioxide by causing particles of electrodeposited manganese dioxide to collide with each other to produce a pulverized material, screening the pulverized material to an average particle size of 3 to 20 μm thereby to produce a screened material, mixing said screened material with a lithium raw material to form a mixture, and firing the mixture to produce lithium manganate, wherein during screening, electrolytic manganese dioxide having an average particle size smaller than 3 μm is removed from the screened material.

US 6,409,986 B1

ZEOLITE ITQ-5

Miguel-Angel Camblor Fernandez; Avelino Corma Canos, and Susana Valencia Valencia, all of Valencia, Spain, assignors to Consejo Superior de Investigaciones Cientificas Universidad Politecnica de Valencia

PCT No. PCT/ES98/00347, § 371 Date Jun. 19, 2000, § 102(e) Date Jun. 19, 2000, PCT Pub. No. WO99/32405, PCT Pub. Date Jul. 1, 1999

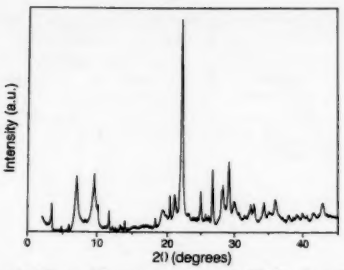
PCT Filed Dec. 18, 1998, Appl. No. 581,877

Claims priority, application Spain, Dec. 19, 1997, 9702696

Int. Cl. C01B *39/48;* **C07C** *2/58;* **C10G** *11/00;35/06*

U.S. Cl. 423—705 **21 Claims**

1. A micro-porous zeolite material with an x-ray diffraction



pattern coinciding with patterns shown in Tables 1 and 2 in the as-synthesized and calcined form, respectively.

US 6,409,987 B1

TARGETED AGENTS USEFUL FOR DIAGNOSTIC AND THERAPEUTIC APPLICATIONS

Alan D. Cardin, Cincinnati, and Cornelius L. Van Gorp, Springboro, both of Ohio, assignors to Intimax Corporation, Cincinnati, Ohio

Provisional application No. 60/128,139, filed on Apr. 7, 1999. This application Apr. 6, 2000, Appl. No. 544,266.

Int. Cl. A61K *51/00;* **A61M** *36/14*

U.S. Cl. 424—1.73 **20 Claims**

1. A targeted agent having an avidity for thrombin that comprises a dermatan sulfate having more than about 25% repeating L-iduronic acid→4,6-di-O-sulfated N-acetyl-D-galactosamine disaccharide units that is covalently attached to a radioactive metal-ion binding moiety.

US 6,409,988 B1

RADIOLABELED 1-ARYL PYRAZOLES, THE SYNTHESIS THEREOF AND THE USE THEREOF AS PEST GABA RECEPTOR LIGANDS

Daljit S. Dhanoa, West Chester; Sanath Meegalla, Devon, both of Pa.; Dario Doller, Branford, Conn., and Richard M. Soll, Lawrenceville, N.J., assignors to 3-Dimensional Pharmaceuticals, Inc., Exton, Pa.

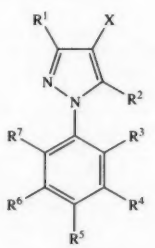
Provisional application No. 60/141,844, filed on Jul. 1, 1999. This application Jun. 29, 2000, Appl. No. 606,051.

Int. Cl. A61K *51/00;* **C07D** *231/10*

U.S. Cl. 424—1.81 **16 Claims**

1. A radiolabeled compound of Formula I:

I



or a salt thereof, where

R^1 represents R^8, R^8O, R^8SO_2, R^8SO or R^8S in which R^8 is tritiated methyl, deuterated methyl, [^{13}C]methyl or [^{14}C]methyl;

X is halo, cyano, C_{1-6} alkoxycarbonyl, C_{2-6} alkynyl, optionally substituted C_{6-14} aryl or an optionally substituted 5- to 7-membered heteroaromatic ring linked to thiazole via a carbon-carbon bond;

R^2 is hydrogen or amino; and

R^3–R^7 each represent hydrogen, halogen, straight- or branched-chain C_{1-4} alkyl or C_{1-4} alkoxy, either of which is unsubstituted or substituted by one or more halogen atoms, straight- or branched-chain C_{1-4} alkylthio or C_{1-4} alkylsulphinyl, either of which is substituted by one or more halogen atoms, nitro, cyano, or straight- or branched-chain Ci_{1-4} alkylsulphonyl group which is unsubstituted or substituted by one or more halogen atoms.

US 6,409,989 B2

INJECTABLE CARBON COMPOSITIONS IN STABLE AQUEOUS SUSPENSION; METHOD FOR PREPARING THEM AND METHOD OF PRESURGICAL MARKING IN THE INVESTIGATION OF NONPALPABLE MAMMARY PATHOLOGIES BY APPLYING SAID COMPOSITIONS

Pedro Humberto Arturo Matianich, and Juliana Gabor, both of Buenos Aires, Argentina, assignors to Laboratorios Temis Lostalo S.A., Argentina

Division of application No. 09/479,361, filed on Jan. 7, 2000, now abandoned. This application Dec. 6, 2000, Appl. No. 731,336.

Claims priority, application Argentina, Jun. 28, 1999, 990103112

Int. Cl. A61K *49/00;49/22;33/44;* **C01B** *31/08*

U.S. Cl. 424—9.1 **3 Claims**

1. A process for preparing activated carbon ground to a particle size not exceeding 50 μm for use in a free-flowing acqueous suspension for presurgical marking of mammary lesions, characterized in that a charge of activated carbon is ground for a period of from about 25 to about 60 hours in a cylindrical rod mill having a grinding chamber coated with a non-abrasive lining and containing rods.

US 6,409,990 B1

MACROMOLECULAR CARRIER FOR DRUG AND DIAGNOSTIC AGENT DELIVERY

David R. Vera, San Diego, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Provisional application No. 60/134,329, filed on May 14, 1999. This application May 12, 2000, Appl. No. 569,466.

Int. Cl. A61B *5/0555;* **A61K** *49/00;49/04;31/715;* **A01N** *43/04*

U.S. Cl. 424—9.35 **31 Claims**

1. A carrier molecule comprising:

a backbone, wherein said backbone is dextran;

wherein said backbone having affixed thereto a plurality of groups having structure —$O(CH_2)_3S(CH_2)_2NH_2$;

wherein said carrier is water soluble, non-toxic to humans and essentially cross-link free; and

comprises at least one additional chemical group conjugated to the amino group of at least one said groups having the structure —$O(CH_2)_3S(CH_2)_2NH_2$.

US 6,409,991 B1

TREATMENT AND SYSTEM FOR NICOTINE WITHDRAWAL

Mark Reynolds, 4 Sidehill Rd., Westport, Conn. 06880

Filed Dec. 15, 1999, Appl. No. 464,549

Int. Cl. A61K *9/68;31/465*

U.S. Cl. 424—48 **2 Claims**

1. A therapeutic method to alleviate the craving associated with cessation of nicotine use in a human comprising: administering to a human in need of such treatment a combination of a first treatment and a second treatment, the first treatment comprising a therapeutically effective amount of nicotine, a nicotine metabolite or combination of nicotine metabolites or their pharmaceutically acceptable salts thereof to alleviate nicotine cravings and the second treatment comprising a therapeutically effective amount of xylitol to help reduce dental caries and alleviate oral cravings, wherein said first treatment comprises a plurality of pieces of substantially zylitol-free nicotine gum, each of said pieces of nicotine gum containing 2–4 mg of nicotine and said second treatment comprises multiple pieces of substantially nicotine-free xylitol gum each of said pieces of xylitol gum comprising at least 1 mg of xylitol.

US 6,409,992 B1

COMPOSITIONS TO CONTROL ORAL MICROBIAL OXIDATION-REDUCTION (E_H) LEVELS

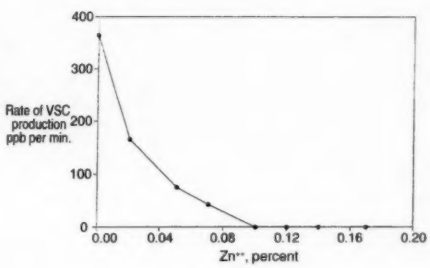
Israel Kleinberg, Smithtown, and Milroy Codipilly, Coram, both of N.Y., assignors to The Research Foundation of State University of New York, Stony Brook, N.Y.

PCT No. PCT/US97/19598, § 371 Date Jun. 10, 1998, § 102(e) Date Jun. 10, 1998, PCT Pub. No. WO98/17195, PCT Pub. Date Apr. 30, 1998

Continuation-in-part of application No. 08/736,356, filed on Oct. 23, 1996, now abandoned. This PCT application Oct. 23, 1997, Appl. No. 77,249.

Int. Cl. A61K *7/16;7/20;33/40*

U.S. Cl. 424—49 **47 Claims**



1. An oral composition comprising a first component containing a zinc compound which yields freely available zinc ions in a first vehicle suitable for introduction to the oral cavity and a second component containing an oxidation potential raising compound in a second vehicle suitable for introduction to the oral cavity, wherein said first and second components are stored separately and mixed prior to using the oral composition.

US 6,409,993 B1

DENTAL BLEACHING COMPOSITIONS INCORPORATING PERBORATES

Steven D. Jensen, South Jordan, and Dan E. Fischer, Sandy, both of Utah, assignors to Ultradent Products, Inc., South Jordan, Utah

Filed Nov. 4, 1999, Appl. No. 433,442

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *7/16;7/20*

U.S. Cl. 424—53 **24 Claims**

1. A stable, one-part dental bleaching composition comprising:

at least one perborate dental bleaching agent included in an amount in a range from about 1% to about 50% by weight of the dental bleaching composition;

at least one liquid polyol; and

a quantity of at least one finely divided particulate gelling agent which, when mixed with the liquid polyol, yields a sticky and viscous dental composition.

US 6,409,994 B1

PREPARATION FOR DENTAL TREATMENT

Stefan Dahlin, Hovas, Sweden, assignor to MediTeam Dental AB, Savedalen, Sweden

PCT No. PCT/SE99/02456, § 371 Date Jul. 18, 2001, § 102(e) Date Jul. 18, 2001, PCT Pub. No. WO00/42974, PCT Pub. Date Jul. 27, 2000

PCT Filed Dec. 22, 1999, Appl. No. 889,482

Claims priority, application Sweden, Jan. 19, 1999, 9900148

Int. Cl. A61K *7/22;6/00;7/20;33/22;* **C11D** *3/395*

U.S. Cl. 424—53 **7 Claims**

1. A preparation for chemical-mechanical treatment of caries, said preparation comprising:

a first solution, free of amines and containing active chlorine; and

a second solution, free of active chlorine and containing at least one amine capable of forming a chloramine compound in the presence of active chlorine, wherein said at least one amine is free of carboxyl groups, said amine having at least one proton bound to at least one amino-nitrogen.

US 6,409,995 B1

USE OF AMINO-SUBSTITUTED HYDROXYBENZOPHENONES AS PHOTOSTABLE UV FILTERS IN COSMETIC AND PHARMACEUTICAL PREPARATIONS

Thorsten Habeck, Meckenheim; Frank Prechtl, Frankfurt; Thomas Wünsch, Speyer; Horst Westenfelder, Neustadt; Sylke Haremza, Neckargemünd; Thorsten Bach, and Anja Spiegel, both of Marburg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 20, 2000, Appl. No. 553,897

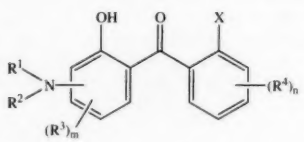
Claims priority, application Germany, Apr. 20, 1999, 199 17 906

Int. Cl. C07D *493/10;97/10;69/734;101/60;* **B41M** *5/145;5/124;* **C09B** *11/28*

U.S. Cl. 424—59 **7 Claims**

1. A method of protecting human skin or human hair from UV-radiation comprising treating said hair or skin with an effective amount of a cosmetic or a pharmaceutical formulation containing an amino-substituted hydroxybenzophenone of formula I

I



in which the variables independently of one another have the following meanings:

R^1 and R^2 are hydrogen, C_1–C_{20}-alkyl, C_2–C_{10}-alkenyl, C_3–C_{10}-cycloalkyl, C_3–C_{10}-cycloalkenyl, where the substituents R^1 and R^2 together with the nitrogen atom to which they are bonded can form a 5- or 6-membered ring;

R^3 and R^4 are C_1–C_{20}-alkyl, C_2–C_{10}-alkenyl, C_3–C_{10}-cycloalkyl, C_3–C_{10}-cycloalkenyl, C_1–C_{12}-alkoxy, C_1–C_{20}-alkoxycarbonyl, C_1–C_{12}-alkylamino, C_1–C_{12}-dialkylamino, aryl, heteroaryl, optionally substituted, substituents which confer solubility in water, chosen from the group consisting of a nitrile group, carboxylate, sulfonate or ammonium radicals;

X is hydrogen, $COOR^5$, $CONR^6R^7$;

R^5 to R^7 are hydrogen, C_1–C_{20}-alkyl, C_2–C_{10}-alkenyl, C_3**14** C_{10}-cycloalkyl, C_3–C_{10}-cycloalkenyl, —(Y—O)$_n$—Z,aryl;

Y is —$(CH_2)_2$—, —$(CH_2)_3$—, —$(CH_2)_4$—, —CH(CH_3)—CH_2—;

Z is —CH_2—CH_3, —CH_2—CH_2—CH_3, —CH_2—CH_2—CH_2—CH_3, —CH(CH_3)—CH_3;

m is from 0 to 3;

n is from 0 to 4;

is from 1 to 20

as a photostable UV filter.

US 6,409,996 B1

COMPOSITION COMPRISING ONE OR MORE FLAVONOIDS, METHOD OF OBTAINING SUCH COMPOSITION AND USE THEREOF AS UV-ABSORBING AGENT

Kim Plaschke, Næstved, Denmark, assignor to Flavone Sunproducts A/S, Naestved, Denmark

PCT No. PCT/DK98/00505, § 371 Date May 19, 2000, § 102(e) Date May 19, 2000, PCT Pub. No. WO99/25316, PCT Pub. Date May 27, 1999

PCT Filed Nov. 19, 1998, Appl. No. 554,763

Claims priority, application Denmark, Nov. 19, 1997, 1316/97

Int. Cl. A61K *7/42;7/00;31/35*

U.S. Cl. 424—59 **27 Claims**

1. A composition comprising flavonoids including at least one flavanone selected from the group consisting of naringin, neohesperidin, neoeriocitrin and isonaringin, and at least one flavone comprising rhoifolin, said composition having a UV-absorbency at 282 nm in water where said at least one flavanone accounts for 75–98% of UV-absorbency of said flavonoids, and where flavones accounts for 2–25% of UV-absorbency of said flavonoids at 282 nm.

US 6,409,997 B1

WAX COSMETIC STICK

Mauricio Castro, Ranchos Palos Verdes, Calif., assignor to Neutrogena Corporation, Los Angeles, Calif.

Filed Jul. 31, 2000, Appl. No. 628,483

Int. Cl. A61K *7/42;7/44;7/021;7/025;* **A01N** *25/08*

U.S. Cl. 424—59 **25 Claims**

1. A cosmetic stick composition comprising,

(a) a skin care agent;

(b) a solid wax;

(c) a non-oil emollient selected from the group consisting of C12–15 alkyl benzoate, neopentyl glycol dioctanoate, neopentyl glycol diisostearate, butyloctyl salicylate, and dibutyl adipate; and

(d) a silicone elastomer,

wherein said composition comprises less than 1%, by weight, of oil.

US 6,409,998 B1

UV-PHOTOPROTECTING EMULSIONS COMPRISING MICRONIZED INSOLUBLE SCREENING AGENTS AND ASSOCIATIVE POLYMERS

Didier Candau, Bievres; Serge Forestier, Claye Souilly, and Anne-Marie Pisson, Boussy St Antoine, all of France, assignors to Societe L'Oreal, Paris, France

Filed Oct. 23, 2000, Appl. No. 693,889

Claims priority, application France, Oct. 22, 1999, 99/13220

Int. Cl. A61K *7/42;7/44;7/00*

U.S. Cl. 424—59 **81 Claims**

1. A topically applicable UV-photoprotecting cosmetic/dermatological emulsion comprising

(a) at least one aqueous phase;

(b) at least one fatty phase;

(c) an effective UV-photoprotecting amount of at least one micronized organic UV-screening agent insoluble in the emulsion, the mean particle size of said micronized particles ranging from 0.01 to 2 μm; and

(d) at least one associative polymer, said at least one associative polymer being anionic, cationic or amphoteric.

US 6,409,999 B2
SYNERGISTICALLY UV-PHOTOPROTECTING BENZOTRIAZOLE-SUBSTITUTED SILICON/CINNAMIC ACID COMPOSITIONS

Isabelle Agostini, Chatenay Malabry; Pascal Arnaud, L'Hay les Roses, and Sylvie Guillard, Bondy, all of France, assignors to Societe L'Oreal, Paris, France

Continuation of application No. PCT/FR00/01696, filed on Jun. 20, 2000. This application Mar. 2, 2001, Appl. No. 796,636.

Claims priority, application France, Jul. 2, 1999, 99 08568

Int. Cl. A61K *7/42;7/44;7/00*

U.S. Cl. 424—59 **27 Claims**

1. A topically applicable cosmetic/dermatological composition suited for improvedly UV-photoprotecting human skin and/or hair against the deleterious effects of ultraviolet irradiation, comprising SPF-synergistically enhancing amounts of (a) at least one UV-screening benzotriazole-substituted silicon compound and (b) at least one UV-screening cinnamic acid derivative, formulated into (c) a topically applicable, cosmetically/dermatologically acceptable vehicle, diluent or carrier therefor.

US 6,410,000 B1
CYCLOPENTYLALKYL-NITRILES

Jerzy A. Bajgrowicz, Zürich; Bernadette Bourdin Trunz, Gen`eve, and Peter Gygax, Fällanden, all of Switzerland, assignors to Givaudan SA, Switzerland

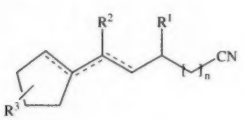
Filed Jul. 5, 2000, Appl. No. 609,845

Claims priority, application European Pat. Off., Jul. 5, 1999, 99810585

Int. Cl. A61K *7/32;* **C07C** *255/00*

U.S. Cl. 424—65 **8 Claims**

1. A compound of formula I



I

wherein

R^1 and R^3 are independently H, or C_{1-3} alkyl, and R^2 is H, C_{1-3} alkyl, methylene or ethylidene, with the proviso that R^1 and R^2 are not simultaneously H;

n is 0 or 1; and

==== is a single or a double bond, wherein a maximum of two double bonds are present in the compound.

8. A method for imparting a fragrance to a substrate comprising applying to the substrate a compound according to claim **1**.

US 6,410,001 B1
COSMETIC COMPOSITIONS

Kevin Ronald Franklin; Ian Peter Stott, both of Wirral, and Rahila Bhat, Nelson, all of United Kingdom, assignors to Unilever Home & Personal Care, USA, a division of Conopco, Inc., Chicago, Ill.

Filed Jul. 21, 2000, Appl. No. 620,858

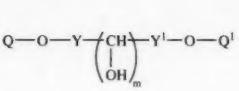
Claims priority, application European Pat. Off., Jul. 23, 1999, 99305840

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *7/32;7/34;7/00*

U.S. Cl. 424—65 **33 Claims**

1. A composition of matter suitable for cosmetic use comprising a continuous phase which contains a water-immiscible liquid and a structurant therein which comprises at least one structurant compound of the general formula



(I)

in which Y and Y^1 are each independently —CH_2— or >CO Q and Q^1 are each independently a hydrocarbyl group of at least 6 carbon atoms, and m is from 2 to 24.

US 6,410,002 B2
PREPARATION OF ANTIPERSPIRANT GELS WHICH OBVIATES THE USE OF SIMPLE GLYCOLS

Anthony Aloysius Scafidi, Westchester; Zhuning Ma, Schaumburg, and David Allen Brewster, Buffalo Grove, all of Ill., assignors to Unilever Home & Personal Care USA division of Conopco, Inc., Chicago, Ill.

Provisional application No. 60/204,060, filed on May 12, 2000. This application May 11, 2001, Appl. No. 853,347.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *7/32;7/34;7/38;7/00*

U.S. Cl. 424—65 **4 Claims**

1. A clear emulsion and gel cosmetic composition which is an antiperspirant and/or deodorant composition which comprises a water-in-oil emulsion comprising:

a) about 65% to about 75% of an aqueous solution of an effective amount of antiperspirant active;

b) about 25% to about 35% of an oil phase consisting of silicones, emollients and a silicone emulsifying agent, and comprising at least one volatile silicone, at least one non-volatile ester or at least one nonvolatile silicone, and wherein at least one oil phase soluble ingredient has a refractive index of about 1.40 to about 1.45;

c) about 0.01 to about 8.5% of a coupling agent; and

d) at least one polymeric ethylene oxide glycol adduct which component raises the refractive index of said aqueous solution, and optionally another water soluble, non-simple glycol component which raises the refractive index of said aqueous solution;

wherein said composition is essentially free of glycols and low and middle chain alcohols.

US 6,410,003 B1
ANTIPERSPIRANT COMPOSITIONS

Shameem Bhatia; Kevin Ronald Franklin, both of Bebington; Lara Dimitrova Stoimenof, London, and Michael Stephen White, Bebington, all of United Kingdom, assignors to Unilever Home & Personal Care USA division of Conopco, Inc., Greenwich, Conn.

Filed Aug. 2, 2001, Appl. No. 920,777

Claims priority, application United Kingdom, Aug. 4, 2000, 0019231

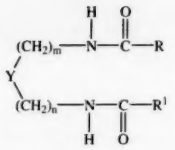
Int. Cl. A61K *7/32;7/34;7/38;7/00*

U.S. Cl. 424—65 **32 Claims**

1. An antiperspirant composition comprising:

(i) a continuous phase which comprises water-immiscible liquid carrier,

(ii) a structurant therein which is at least one amido-containing compound of the general formula



wherein R and R^1 each independently denote an organic moiety of 5 to 27 carbon atoms, m and n are independently 0 or 1, Y is a cyclohexane ring bearing the amido-containing substituent groups

in 1,2 or 1,3 positions; and

(iii) an antiperspirant active material.

US 6,410,004 B1

POLYUREAS AND WATER-SOLUBLE OR WATER-DISPERSIBLE POLYMERIC SALTS

Son Nguyen Kim, Hernsbach; Axel Sanner, Frankenthal, and Peter Hössel, Schifferstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 13, 2000, Appl. No. 523,695

Claims priority, application Germany, Mar. 12, 1999, 199 10 996

Int. Cl. A61K *7/06*

U.S. Cl. 424—70.1 **13 Claims**

1. A water-soluble or water-dispersible polymeric salt comprising

A) a base polymer which contains an ionic or ionogenic group, and

B) a neutralizing polymer, which are film-forming and water-dispersible which partially neutralizes the ionic or ionogenic group of the base polymer A, where the ionogenic groups of the base polymer A are more frequent by a factor of from 2 to 30 than the ionogenic groups of the neutralizing polymer B wherein at least one of the base polymer A and the neutralizing polymer B is a polyurea.

11. A setting polymer in hair cosmetics, hair sprays, hair foams and shampoos comprising a polymeric salt as claimed in claim **1**, wherein said polymeric salt has a glass transition temperature of >10° C.

US 6,410,005 B1

BRANCHED/BLOCK COPOLYMERS FOR TREATMENT OF KERATINOUS SUBSTRATES

Ramiro Galleguillos, Hudson; David J. Smith, Amherst; Steven A. Constantino, LaGrange, and Daniel F. Hasman, Jr., North Royalton, all of Ohio, assignors to PMD Holdings Corp., Cleveland, Ohio

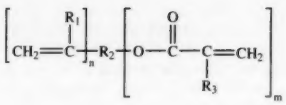
Continuation-in-part of application No. 09/223,664, filed as application No. PCT/US99/30790, filed on Dec. 22, 1999. This application Jun. 15, 2000, Appl. No. 594,321.

Int. Cl. A61K *7/06;7/11;7/00;9/00;* **A61L** *9/04*

U.S. Cl. 424—70.16 **55 Claims**

1. A film forming block copolymer formed in the presence of a free radical initiator from:

(A) a polyfunctional monomeric chain extender having at least two functional groups, the reactivity of one functional group being substantially higher than that of the other functional group, wherein the polyfunctional chain extender has the formula:

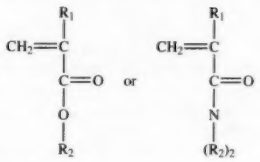


where n and m independently are integers from 1 to 4; R_1 and R_3 independently are H or alkyl; and R_2 is alkylene, cycloalkylene, arylene, $—(CH_2—CH_2—O)_p—$ where p=1 to 50, $—CH_2(CH_3)—CH_2—O)_p—$ where p=1 to 50, amido, ester, or combinations thereof;

(B1) a first ethylenically unsaturated monomer or monomers which copolymerize in the presence of a free radical initiator preferentially with the functional group of the polyfunctional chain extender which has a higher reactivity to form a first block, wherein the first ethylenically unsaturated monomer comprises one or more of:

(1) acrylic acid or methacrylic acid; fumaric acid, itaconic acid or aconitic acid; maleic anhydride; and

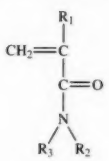
(2) esters or amides respectively having the formula:



wherein R_1 is —H, $—CH_3$, or $—CH_2CH_3$; and R_2 is an aliphatic hydrocarbon functional group having at least one carbon, a polynuclear aromatic hydrocarbon group, an alkylaryl wherein the alkyl has one or more carbons, a haloalkyl having 4 or more carbons, a polyalkyleneoxy group wherein said alkylene is propylene or higher alkylene and there is at least 1 alkyleneoxy unit per hydrophobic moiety; α-olefins; vinyl alkylates; vinyl alkyl ethers; N-vinyl amides; or combinations thereof, and

(B2) a second ethylenically unsaturated monomer or monomers which copolymerizes in the presence of a free radical initiator with the functional group of the polyfunctional chain extender which has the lesser reactivity to form a second block, wherein the second ethylenically unsaturated monomer comprises one or more of:

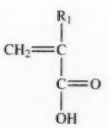
(1) an ethylenically unsaturated amide having the formula:



where R_1 is —H, $—CH_3$, $—CH_2—CH_3$, branched or linear alkyl, aryl, or cycloalkyl; and R_2 and R_3 independently are —H, $—CH_3$, $—CH_2—CH_3$, branched alkyl, linear alkyl, aryl, cycloalkyl, acid or salt functional, amino functional, or quaternized groups, or combinations thereof; and

(2) ethylenically unsaturated carboxylic acids having at least one of the following formulas:

(A)



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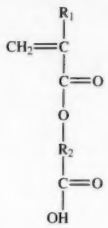
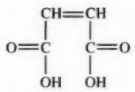
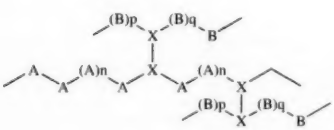




where R_1 is —H, —CH_3, or —CH_2CH_3; and R_2 is —$[CH_2—]_n$ where n is an integer from 1 to 40, linear or branched alkylene, cycloalkylene, arylene, polyethylene oxide; or polypropylene oxide; methacrylic acid, crotonic acid, itaconic acid and fumaric acid; half esters of maleic and fumaric acids; or combinations thereof; and

wherein said (A) polyfunctional monomeric chain extender comprises from about 0.005 to 2 mole percent of the total monomers and substantially does not itself polymerize; said (B1) first ethylenically unsaturated monomer comprises from about 5 to about 95 mole percent of the total monomers; and said (B2) second ethylenically unsaturated monomer comprises from about 5 to about 70 mole percent of the total monomers; wherein said block copolymer has an average molecular weight up to 1,000,000, said first block is more hydrophobic than said second block, said first block has a molecular weight of at least 10,000 and a glass transition temperature of about 30° C. or less, and said second block has a molecular weight of at least 1,000 and glass transition temperature of greater than 30° C., wherein said film forming block copolymer has substantially the following structure:



wherein A represents a block obtained from the first ethylenically unsaturated monomer or monomers, B represents the block obtained from the second ethylenically unsaturated monomer or monomers and X represents the unit obtained from the polyfunctional monomeric chain extender; n represents the degree of polymerization of the A-block which is larger than 100 and q and p represents the degree of polymerization of the B-block which is larger than 100 such that either q or p can be zero but not both at the same time.

US 6,410,006 B2

COMPOSITION FOR PROPHYLAXIS AND/OR TREATMENT OF DRY EYE SYNDROME COMPRISING VITAMIN D

Seiji Itoh, Mobara; Yasuo Ishii, Kawaguchi; Katsuhiko Mukai, Kashiwa, and Kiyoshi Kita, Tokyo, all of Japan, assignors to New Vision Co., Ltd., Tokyo, Japan

Continuation of application No. 08/872,052, filed on Jun. 10, 1997, now abandoned. This application Feb. 16, 2001, Appl. No. 784,147.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *31/74;* **A61F** *2/00*

U.S. Cl. 424—78.04 **4 Claims**

(C) **1**. An ophthalmic composition for prophylaxis and/or treatment of keratoconjunctivitis sicca, which is locally administered to the eyes and which comprises, as an effective component, at least one member selected from the group consisting of vitamin D, active vitamin D, and active vitamin D analogues.

US 6,410,007 B1

ANTAGONISM OF ENDOTHELIN ACTIONS

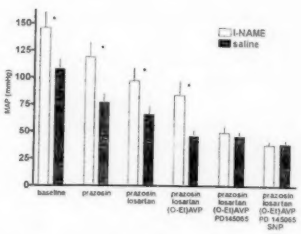
James D. Banting, Kingston; Jeremy P. W. Heaton, Gananaque, and Michael A. Adams, Kingston, all of Canada, assignors to Queen's University at Kingston, Canada

Continuation of application No. PCT/CA97/00169, filed on Mar. 13, 1997, which is a continuation-in-part of application No. 08/615,659, filed on Mar. 13, 1996, now Pat. No. 5,688,499. This application Sep. 14, 1998, Appl. No. 152,874.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *49/00;38/00;* **A61N** *31/17;* **G01N** *31/00*

U.S. Cl. 424—78.35 **11 Claims**



1. A method for downregulating dothelin-mediated vascular growth activity of the pudendal vasculature in a patient independently of any normal or abnormal systemic physiology, comprising the step of administering to the patient an effective amount of an agent which antagonizes action of endothelin, in a pharmaceutically acceptable carrier therefor.

US 6,410,008 B1

CHIMERIC IL-10 PROTEINS AND USES THEREOF

Terry B. Strom; Xin Xiao Zheng, both of Brookline, and Alan Steele, Wellesley, all of Mass., assignors to Beth Israel Hospital Association, Boston, Mass.

Filed Dec. 12, 1994, Appl. No. 355,502

Int. Cl. C07K *14/54;* **A61K** *38/20;* **C12N** *15/24*

U.S. Cl. 424—85.2 **7 Claims**

1. A chimeric protein comprising a mature IL-10 bonded to a polypeptide, said polypeptide comprising the Fc region of IgG, said Fc region of IgG having a circulating half-life by itself which is greater than that of IL-10.

US 6,410,009 B1

PHARMACEUTICAL COMPOSITION FOR TREATING HEPATITIS B VIRUS (HBV) INFECTION

Eithan Galun, Har Adar; Orit Nahor, Jerusalem, both of Israel, and Hubert E. Blum, Freiburg, Germany, assignors to Hadasit Medical Research Services & Development Co., Ltd., Jerusalem, Israel

Continuation-in-part of application No. 08/795,473, filed on Feb. 11, 1997, now Pat. No. 6,217,858. This application Nov. 12, 1999, Appl. No. 439,856.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *45/05;39/29;38/20;* **C07K** *4/12;14/54*

U.S. Cl. 424—85.2 **21 Claims**

1. A method of inhibiting the infection of hepatocytes by HBV, comprising administering to a human patient a soluble active agent which inhibits the interaction between human interleukin 6 (hIL6) and hepatocytes, and thereby inhibits the activation of gp130 and the internalization of HBV into the hepatocytes, wherein the soluble active agent is selected from the group consisting of glycoprotein 80 (gp80) or a portion thereof, said portion spanning gp80 amino acids 113–323 and having receptor sites that interact with hIL6 and competitively inhibit the interaction between hIL6 and hepatocytes, glycoprotein 130 (gp130) or a portion thereof, said portion including amino acids 1–94 and 141–230, having receptor sites that interact with hIL6 and competitively inhibit the interaction between hIL6 and hepatocytes, hIL6 peptide LYS41-ALA56, hIL6 peptide GLY77-GLU95, hIL6 peptide GLN153-HIS165, a combined β1 and β2 hIL6 mutant (mhIL6β1+β2), mhIL6β1+β2 substituted with phe 171 to leu and ser 177 to arg, and mixtures of any of the foregoing.

US 6,410,010 B1

RECOMBINANT P53 ADENOVIRUS COMPOSITIONS

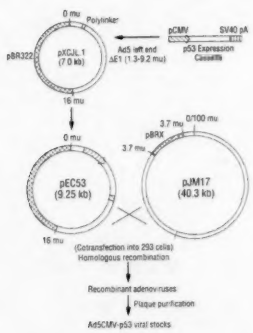
Wei-Wei Zhang, Sugar Land, and Jack A Roth, Houston, both of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of application No. 07/960,513, filed on Oct. 13, 1992, now Pat. No. 6,017,524. This application Oct. 29, 1993, Appl. No. 145,826.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *48/00;* **C12N** *15/861*

U.S. Cl. 424—93.2 **18 Claims**



1. A recombinant adenovirus which carries an adenovirus vector construct comprising an expression region encoding p53 under the control of a cytomegalovirus immediate early promoter, wherein infection of a tumor cell with said adenovirus results in a p53 protein level sufficient to inhibit tumor cell growth in vivo.

US 6,410,011 B1

GENE THERAPY FOR RESTENOSIS USING AN ADENOVIRAL VECTOR

Didier Branellec, La Varenne Saint-Hilaire; Jean-François Dedieu, Paris; Patrice Denefle, Saint Maur; Laurent Feldman, Paris; Michel Perricaudet, Ecrosnes, and Philippe Gabriel Steg, Paris, all of France, assignors to Aventis Pharma S.A., Antony, France

PCT No. PCT/FR95/01074, § 371 Date Jun. 20, 1996, § 102(e) Date Jun. 20, 1996, PCT Pub. No. WO96/05321, PCT Pub. Date Feb. 22, 1996

PCT Filed Aug. 10, 1995, Appl. No. 633,769

Claims priority, application France, Aug. 17, 1994, 94 10083

Int. Cl. A61K *48/00;* **C12N** *15/861*

U.S. Cl. 424—93.2 **24 Claims**

1. A method for inhibiting proliferation of vascular smooth muscle cells comprising local administration to a site of physical damage to an atheromatous blood vessel of a replication defective recombinant adenovirus comprising:

a suicide gene operably linked to a promoter controlling expression of said gene in infected cells,

a left and a right ITR, and

an encapsidation signal

wherein said replication defective adenovirus is of human or canine origin and wherein said inhibition of proliferation inhibits a decrease in luminal diameter of said blood vessel occurring after said physical damage to said blood vessel.

US 6,410,012 B1

ANTIMICROBIAL MEDIATED BACTERIAL DNA DELIVERY

Donata R. Sizemore, Brentwood, Mo.; Jerald C. Sadoff, Washington, D.C., and Jason C. Grove, Ashton, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Provisional application No. 60/042,090, filed on Mar. 28, 1997. This application Mar. 27, 1998, Appl. No. 49,566.

Int. Cl. A01N *63/00;* **A61K** *48/00*

U.S. Cl. 424—93.2 **15 Claims**

1. A method of delivering a functional DNA into a cell in vitro, said method comprising

(i) introducing a functional DNA into attenuated bacteria able to enter cells;

(ii) allowing said attenuated bacteria to enter said cell; and

(iii) administering an antimicrobial to the cell of step (ii), wherein said antimicrobial enters said cell resulting in lysis of said bacteria inside said cell such that said functional DNA is released into said cell.

US 6,410,013 B1

VIRAL VECTORS FOR USE IN MONITORING HIV DRUG RESISTANCE

Jian-yun Dong, Mt. Pleasant, S.C., assignor to Musc Foundation for Research Development, Charleston, S.C.

Continuation of application No. PCT/US00/00782, filed on Jan. 12, 2000, and a continuation-in-part of application No. 09/314,259, filed on May 18, 1999, Provisional application No. 60/117,136, filed on Jan. 25, 1999. This application Apr. 26, 2000, Appl. No. 559,244.

Int. Cl. A01N *63/00*

U.S. Cl. 424—93.2 **23 Claims**

1. A recombinant adenoviral vector, comprising:

a reporter sequence comprising a reporter gene whose expression is regulated by an HIV specific protein; and

a receptor sequence comprising a CD4 gene and one or more coreceptor genes, wherein cells transduced by the recombinant adenoviral vector express CD4 and the one or more coreceptors such that productive infection of the transduced cells by HIV is achieved, productive infection being defined

as HIV viral replication and infection of non-infected cells in a culture of the transduced cells.

US 6,410,014 B1

REDIRECTION OF CELLULAR IMMUNITY BY PROTEIN-TYROSINE KINASE CHIMERAS

Brian Seed, Boston; Charles Romeo, Belmont, and Waldemar Kolanus, Watertown, all of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Continuation of application No. 08/394,177, filed on Feb. 24, 1995, now Pat. No. 5,912,170, which is a continuation-in-part of application No. 08/093,210, filed on Jul. 16, 1993, now abandoned, which is a continuation-in-part of application No. 07/847,566, filed on Mar. 6, 1992, now abandoned, which is a continuation-in-part of application No. 07/665,961, filed on Mar. 7, 1991, now abandoned. This application Jun. 15, 1999, Appl. No. 333,636.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *48/00;* **C12N** *5/00;15/63;* **C07H** *21/04;* **A01N** *63/00*

U.S. Cl. 424—93.21 **14 Claims**

1. A method of signaling a cellular immune response in a mammal, said method comprising administering to said mammal an effective amount of autologous cytotoxic T cells, said autologous cytotoxic T cells expressing:

a first membrane-bound, proteinaceous chimeric receptor comprising (a) an extracellular portion which specifically recognizes and binds a target cell or target infective agent, (b) a transmembrane domain, and (c) an intracellular portion of a Syk protein-tyrosine kinase; and

a second membrane-bound, proteinaceous chimeric receptor comprising (a) an extracellular portion which is capable of specifically recognizing and binding said target cell or said target infective agent, (b) a transmembrane domain, and (c) an intracellular portion which is derived from CD28,

whereby said first and said second receptors specifically recognize and bind said target cell or said target infective agent and said cytotoxic T cells are signaled to destroy said receptor-bound target cell or receptor-bound target infective agent.

US 6,410,015 B1

GENE THERAPY METHODS USING BONE MARROW-DERIVED CELLS EXPRESSING BLOOD CLOTTING FACTORS

Erlinda Maria Gordon; Frederick L. Hall, both of Glendale, and W. French Anderson, San Marino, all of Calif., assignors to University of Southern California, Los Angeles, Calif.

Continuation of application No. 08/747,514, filed on Nov. 12, 1996, now Pat. No. 6,063,893. This application May 11, 2000, Appl. No. 569,323.

This patent is subject to a terminal disclaimer.

Int. Cl. A01N *63/00*

U.S. Cl. 424—93.21 **4 Claims**

1. A method for providing a non-human mammal with a therapeutic protein comprising:

a) capturing TGFβ1-responsive, bone marrow-derived cells under low serum conditions in a collagen matrix impregnated with a TGFβ1 fusion protein comprising a von Willebrand's factor-derived collagen binding site which targets the TGFβ1 protein to the collagen matrix;

b) expanding the captured cells to form differentiated cell colonies;

c) isolating the expanded cells;

d) transducing the expanded cells in vitro with a viral vector comprising a nucleic acid encoding the therapeutic protein, wherein the recombinant protein is selected from the group consisting of factor IX, factor VIIIc, von Willebrand's factor, tissue plasminogen activator, protein C, protein S and antithrombin III; and

e) introducing the transduced cells into the non-human mammal, wherein the transduced cells express the therapeutic protein in vivo.

US 6,410,016 B2

METHOD FOR ADMINISTERING VIABLE MICROORGANISM COMPOSITION FOR POULTRY

Kiyoshi Maruta, and Hiroshi Miyazaki, both of Kanagawa, Japan, assignors to Calpis Co., LTD, Tokyo, Japan

PCT No. PCT/JP98/02440, § 371 Date Dec. 3, 1999, § 102(e) Date Dec. 3, 1999, PCT Pub. No. WO98/54981, PCT Pub. Date Dec. 10, 1998

PCT Filed Jun. 2, 1998, Appl. No. 424,986

Claims priority, application Japan, Jun. 3, 1997, 9-145372

Int. Cl. A01N *63/00;* **C07C** *1/02*

U.S. Cl. 424—93.45 **23 Claims**

1. A method for administering a viable composition of microorganisms to poultry, comprising:

administering an effective amount to inhibit the growth of *C. campylobacter* a first composition to a poultry comprising viable bacteria belonging to *Lactobacillus reuteri* and *Lactobacillus johnsonii*, at the stage of newborn fledgling; and

administering an effective amount to inhibit the growth of *C. campylobacter* a second composition to said poultry comprising a viable microorganism belonging to *Bacillus subtilis*,

wherein antibiotics are not administered to said poultry during at least the grower stage and finishing stage of said poultry.

US 6,410,017 B1

PERSONAL CARE COMPOSITIONS CONTAINING ACTIVE PROTEINS TETHERED TO A WATER INSOLUBLE SUBSTRATE

David John Weisgerber, and Andrew Campbell Allcock, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Provisional application No. 60/101,361, filed on Sep. 22, 1998. This application Sep. 22, 1999, Appl. No. 401,093.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *38/43*

U.S. Cl. 424—94.1 **44 Claims**

1. A personal care wipe composition comprising:

a) a water insoluble substrate,

b) a plurality of active proteins, and

c) a binding means, comprising a polymeric tether, permanently attaching each of the enzymes to the substrate;

wherein the personal care wipe composition comprises from about 0.01 μg/cm^2 to about 1000 μg/cm^2 of the enzyme on the substrate.

US 6,410,018 B1

COMPOSITION AND METHOD FOR LACTOSE HYDROLYSIS

Peter F. Eisenhardt, Philadelphia, Pa., and Leonard P. Smith, Beesley's Point, N.J., assignors to McNeil-PPC, Inc., Skillman, N.J.

Continuation of application No. 08/128,625, filed on Sep. 28, 1993, now abandoned. This application Oct. 17, 1995, Appl. No. 543,975.

Int. Cl. A61K *38/47*

U.S. Cl. 424—94.6 **20 Claims**

1. A solid, orally administrable composition for the enzymatic hydrolysis of lactose, comprising:

a therapeutic effective amount of a first, active lactase having a first optimum pH range;

a therapeutic effective amount of a second, active lactase having a second optimum pH range, wherein said first and second optimum pH ranges being different; and

a solid pharmaceutically acceptable carrier.

US 6,410,019 B1

USE OF G CLASS IMMUNOGLOBULINS FOR THE TOPICAL TREATMENT OF ATOPIC DERMATITIS

Claudio De Simone, Ardea, and Pietro Bruschi, Lissone, both of Italy, assignors to Mendes s.u.r.l., Rome, Italy

PCT No. PCT/IT96/00047, § 371 Date Sep. 11, 1997, § 102(e) Date Sep. 11, 1997, PCT Pub. No. WO96/28186, PCT Pub. Date Sep. 19, 1996

PCT Filed Mar. 12, 1996, Appl. No. 913,339

Claims priority, application Italy, Mar. 14, 1995, RM95A0154

Int. Cl. A61K *39/395;* **C07K** *16/00*

U.S. Cl. 424—130.1 **4 Claims**

1. A method of treating the lesions of atopic dermatitis comprising topically administering to the atopic dermatitis lesions of a patient in need thereof an amount of G class immunoglobulin effective to treat the dermatitis and continuing topical application until the lesions disappear.

US 6,410,020 B1

MONOCLONAL ANTIBODY REACTIVE TO HUMAN CETP AND ASSAY METHOD FOR HUMAN CETP

Masafumi Kamada, Kanagawa; Hiroshi Okamoto, Osaka, and Takuya Tamatani, Kanagawa, all of Japan, assignors to Japan Tobacco, Inc., Tokyo, Japan

Division of application No. 08/945,646, filed as application No. PCT/JP96/01191, filed on May 1, 1996, now Pat. No. 6,140,474. This application Jul. 12, 2000, Appl. No. 615,404.

Claims priority, application Japan, May 2, 1995, 7-134836

This patent is subject to a terminal disclaimer.

Int. Cl. C07K *16/00;* **A61K** *39/395*

U.S. Cl. 424—133.1 **14 Claims**

1. An anti-human CETP monoclonal antibody or a $F(ab')_2$ or Fab' fragment from said monoclonal antibody,

wherein said monoclonal antibody inhibits cholesterol ester transfer activity of human CETP and does not inhibit cholesterol ester transfer activity of rabbit CETP at a concentration of 3 μg/ml or below, and

wherein said monoclonal antibody provides a lower detection limit in an immunoassay of human CETP in non-pretreated human plasma than in human plasma pretreated by detergent or heating.

12. A composition comprising the monoclonal antibody or $F(ab')_2$ or Fab' fragment of claim **1**; and a pharmaceutically acceptable carrier.

US 6,410,021 B1

VACCINES OF PASTEURELLACEAE MUTANTS AND VACCINATION METHOD

Troy E. Fuller, 2200 Lyons Ave., Lansing, Mich. 48910; Martha H. Mulks, 1706 Germany Rd., Williamston, Mich. 48895, and Bradley Thacker, 903 Park Cir., Huxley, Iowa 50124

Division of application No. 08/741,327, filed on Oct. 28, 1996, now Pat. No. 5,925,354, Provisional application No. 60/007,764, filed on Nov. 30, 1995. This application Apr. 22, 1998, Appl. No. 64,935.

Int. Cl. A61K *39/00;39/102;45/00;39/12;* **C12N** *1/36*

U.S. Cl. 424—184.1 **11 Claims**

1. A live vaccine against members of the family of Pasteurellaceae comprising a recombinant mutant of a member of the family of Pasteurellaceae lacking a rib gene necessary for the production of riboflavin in a pharmaceutically acceptable carrier.

US 6,410,022 B1

MODULATION OF CHOLESTERYL ESTER TRANSFER PROTEIN (CETP) ACTIVITY

Charles W. Rittershaus, Malden, Mass., assignor to Avant Immunotherapeutics, Inc., Needham, Mass.

Filed May 1, 1995, Appl. No. 432,483

Int. Cl. A61K *39/00;39/02;* **C07K** *19/00*

U.S. Cl. 424—185.1 **26 Claims**

1. An isolated antigenic hybrid peptide comprising a helper T cell epitope portion linked to a B cell epitope portion, wherein said B cell epitope portion comprises six to 26 consecutive amino acids of the carboxyl terminal 26 amino acids of human cholesteryl ester transfer protein (SEQ ID NO:1).

US 6,410,023 B1

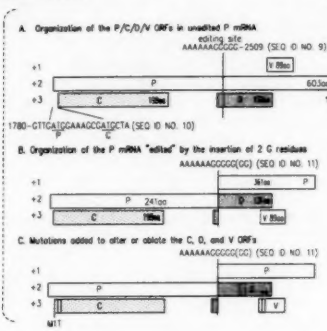
RECOMBINANT PARAINFLUENZA VIRUS VACCINES ATTENUATED BY DELETION OR ABLATION OF A NON-ESSENTIAL GENE

Anna P. Durbin, Takoma Park; Peter L. Collins, Rockville, and Brian R. Murphy, Bethesda, all of Md., assignors to United States of America, Washington, D.C.

Continuation-in-part of application No. 09/083,793, filed on May 22, 1998, Provisional application No. 60/047,575, filed on May 23, 1997, Provisional application No. 60/059,385, filed on Sep. 19, 1997. This application Jul. 9, 1999, Appl. No. 350,821.

Int. Cl. A61K *39/12;39/00;39/155;39/165;* **C12P** *21/06*

U.S. Cl. 424—186.1 **53 Claims**


A. Organization of the P/C/D/V ORFs in unedited P mRNA
editing site
AAAAAACGCGC - 2509 (SEQ ID NO. 9)
+1
+2
+3
P
C
V 88aa
60.3aa
180
1780 - GTTCATCCAAAGCCATCCTA (SEQ ID NO. 10)
B. Organization of the P mRNA "edited" by the insertion of 2 G residues
AAAAAACGCGCG(GG) (SEQ ID NO. 11)
241aa
C. Mutations added to alter or ablate the C, D, and V ORFs
AAAAAACGCGCG(GG) (SEQ ID NO. 11)
MIT

1. An isolated infectious recombinant parainfluenza virus (PIV) comprising a PIV genome or antigenome, a nucleocapsid protein (N), a phosphoprotein (P), and a large polymerase protein (L), wherein a modification is introduced in the genome or antigenome comprising a partial or complete deletion of one or more C, D or V ORF(s) or one or more nucleotide change(s) that reduces or ablates expression of said one or more C, D or V ORF(s).

US 6,410,024 B1

EPITOPES OF SHIGELLA LIKE TOXIN AND THEIR USE AS VACCINE AND IN DIAGNOSIS

James Peter Burnie, and Ruth Christine Matthews, both of Alderley Edge, United Kingdom, assignors to NeuTech Pharma PLC, Manchester, United Kingdom

PCT No. PCT/GB98/02156, § 371 Date Jan. 20, 2000, § 102(e) Date Jan. 20, 2000, PCT Pub. No. WO99/05169, PCT Pub. Date Feb. 4, 1999

PCT Filed Jul. 17, 1998, Appl. No. 463,129

Claims priority, application United Kingdom, Jul. 21, 1997, 9715177

Int. Cl. A61K *39/02*

U.S. Cl. 424—190.1 **6 Claims**

1. An isolated peptide of a Shigella-like toxin, wherein said

peptide carries the epitope consisting of SEQ ID NO: 5, wherein said peptide is selected from the group consisting of SEQ ID NOs 5, 13 and 14.

US 6,410,025 B1

POLYSACCHARIDE PRECIPITATION PROCESS

Russel J. Lander, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of application No. 08/799,329, filed on Feb. 13, 1997, now abandoned, Provisional application No. 60/011,631, filed on Feb. 14, 1996. This application Jun. 1, 1998, Appl. No. 88,381.

Int. Cl. A61K *39/00;39/385;39/102*

U.S. Cl. 424—193.1 **10 Claims**

1. A process for conjugating a polysaccharide to a protein carrier comprising the steps of:

a) precipitating said polysaccharide from an aqueous solution using a long-chain cationic detergent to produce a precipitated polysaccharide;

b) drying said precipitated polysaccharide to remove water;

c) dissolving said precipitated polysaccharide dried in said step (b) in an organic solvent to produce a dissolved polysaccharide;

d) derivatizing said dissolved polysaccharide to produce a derivatized polysaccharide, wherein said derivatizing is started in said organic solvent; and

e) conjugating said derivatized polysaccharide to said protein carrier.

US 6,410,026 B1

METHODS FOR PREPARATION OF VACCINES AGAINST CANCER

Pramod K. Srivastava, Avon, Conn., assignor to Fordham University, Bronx, N.Y.

Division of application No. 08/998,878, filed on Dec. 11, 1997, now Pat. No. 5,948,646. This application Jul. 23, 1999, Appl. No. 360,381.

Int. Cl. A61K *38/00;39/00;35/12;* **C12N** *15/09;15/12*

U.S. Cl. 424—193.1 **30 Claims**

1. A method of treating cancer in an individual having a type of cancer comprising administering to the individual a composition comprising an immunogenic amount of a population of complexes of heat shock protein noncovalently bound to peptides, said complexes being produced by:

(a) making cDNA molecules from RNA molecules of a cancer cell or a preneoplastic cell of said type of cancer;

(b) ligating the cDNA molecules into an expression construct such that substantially each cDNA molecule is operably associated with at least one regulatory region that controls expression of the cDNA molecule, to form a library of expression constructs;

(c) introducing the library into one or more host cells;

(d) culturing the host cells containing the cDNA molecules under conditions such that proteins encoded by the cDNA molecules are expressed by the host cells; and

(e) recovering from the host cells complexes of heat shock protein noncovalently associated with one or more peptides.

US 6,410,027 B1

METHODS FOR PREPARATION OF VACCINES AGAINST CANCER

Pramod K. Srivastava, Avon, Conn., assignor to Fordham University, Bronx, N.Y.

Division of application No. 08/988,878, filed on Dec. 11, 1997, now Pat. No. 5,948,646. This application Jul. 23, 1999, Appl. No. 360,383.

Int. Cl. A61K *38/00;39/00;35/12;* **C12N** *15/09;15/12*

U.S. Cl. 424—193.1 **30 Claims**

1. A method of eliciting an immune response in an individual comprising administering to the individual a composition comprising an immunogenic amount of a population of complexes of heat shock protein noncovalently bound to peptides, said complexes being produced by:

(a) making cDNA molecules from RNA molecules of a cancer or preneoplastic cell;

(b) ligating the cDNA molecules into an expression construct such that substantially each cDNA molecule is operably associated with at least one regulatory region that controls expression of the cDNA molecule, to form a library of expression constructs;

(c) introducing the library into one or more host cells;

(d) culturing the host cells containing the cDNA molecules under conditions such that proteins encoded by the cDNA molecules are expressed by the host cells; and

(e) recovering from the host cells complexes of heat shock protein noncovalently associated with one or more peptides.

US 6,410,028 B1

THERAPEUTIC AND PROPHYLACTIC METHODS USING HEAT SHOCK PROTEINS

Pramod K. Srivastava, Riverdale, N.Y., assignor to Fordham University, Bronx, N.Y.

Division of application No. 08/527,547, filed on Sep. 13, 1995, now Pat. No. 5,935,576. This application Aug. 9, 1999, Appl. No. 372,022.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *39/385;39/12;39/02;39/00;38/00*

U.S. Cl. 424—193.1 **15 Claims**

1. A method of eliciting an immune response against an antigenic peptide or protein in an individual comprising administering to the individual a complex of a heat shock protein noncovalently bound to the antigenic peptide or protein, wherein the complex is made in vitro, and wherein the antigenic peptide or protein is not isolated from a heat shock protein-antigenic peptide or protein complex from within a cell.

US 6,410,029 B1

2-METHOXYESTRADIOL-INDUCED APOPTOSIS IN CANCER CELLS

Tapas Mukhopadhyay, and Jack A. Roth, both of Houston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Division of application No. 08/688,613, filed on Jul. 30, 1996, now Pat. No. 5,958,892. This application Jul. 9, 1999, Appl. No. 351,191.

Int. Cl. A61K *39/00;* **C07K** *1/00;14/00;17/00;* **A01N** *43/04*

U.S. Cl. 424—198.1 **26 Claims**

1. A method for increasing the level of p53 in a human cell in vivo having functional endogenous p53 therein, comprising the step of contacting said cell with an amount of 2-methoxyestradiol sufficient to increase the level of p53 in said cell.

US 6,410,030 B1

PEPTIDE FRAGMENT OF RESPIRATORY SYNCYTIAL VIRUS PROTEIN G, IMMUNOGENIC AGENT, PHARMACEUTICAL COMPOSITION CONTAINING IT AND PREPARATION PROCESS

Hans Binz, Beaumont; Ngoc Thien N'Guyen, Saint-Julien-En-Genevois; Thierry Baussant, Bellegarde, all of France, and Michel Trudel, Quebec, Canada, assignors to Pierre Fabre Medicament, Boulogne-Billancourt, France

Continuation of application No. 08/721,979, filed as application No. PCT/FR95/00444, filed on Apr. 6, 1995, now Pat. No. 6,113,911. This application Sep. 1, 2000, Appl. No. 654,289.

Claims priority, application France, Apr. 6, 1994, 94 04009

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *39/12;39/155*

U.S. Cl. 424—204.1 **2 Claims**

1. A polypeptide which can be used as an immunogenic element carried by the peptide sequence between the amino acid residues 130 and 230 of the sequence of the G protein of human respiratory syncytial virus of subgroup A and of subgroup B, or of bovine respiratory syncytial virus selected from the group consisting of peptides with sequences SEQ ID No. 1, SEQ ID No. 2 and SEQ ID No. 51.

US 6,410,031 B1

ATTENTUATED PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROME VIRUS STRAIN AND METHOD OF USE

Jimmy Kwang, Kentview Park, Singapore, and Te Hung Chang, Tao-Yuan, Taiwan, assignors to Institute of Molecular Agrobiology, Singapore

Filed Nov. 24, 1999, Appl. No. 448,427

Claims priority, application Singapore, Aug. 10, 1999, 9903822

Int. Cl. A61K *39/12*

U.S. Cl. 424—218.1 **3 Claims**

1. An isolated porcine reproductive and respiratory syndrome virus designated JK-100 and having CCTCC Designation No. CCTCC V 200005.

US 6,410,032 B1

ATTENUATED FORMS OF BOVINE VIRAL DIARRHEA VIRUS

Xuemei Cao, East Lyme, and Michael G. Sheppard, Stonington, both of Conn., assignors to Pfizer Inc, New York, N.Y.

Division of application No. 09/433,262, filed on Nov. 4, 1999, now Pat. No. 6,168,942, Provisional application No. 60/107,908, filed on Nov. 10, 1998. This application Oct. 31, 2000, Appl. No. 702,330.

Int. Cl. A61K *39/193;* **C12N** *7/04;7/00;15/09;* **C07H** *21/04*

U.S. Cl. 424—218.1 **4 Claims**

1. A vaccine comprising an attenuated bovine viral diarrhea virus wherein said virus has a genomic nucleic acid sequence comprising the sequence of SEQ ID NO:1 from nt 39 to nt 12116, or a degenerate variant thereof, wherein said degenerate variant encodes the same amino acid sequence encoded by SEQ ID NO:1 from nt 39 to nt 12116, and a veterinarily acceptable carrier.

US 6,410,033 B1

RECOMBINANT INFECTIOUS BOVINE RHINOTRACHEITIS VIRUS

Mark D. Cochran, Carlsbad, Calif., assignor to Syntro Corporation, San Diego, Calif.

PCT No. PCT/US95/01491, § 371 Date Aug. 5, 1996, § 102(e) Date Aug. 5, 1996, PCT Pub. No. WO95/21261, PCT Pub. Date Aug. 10, 1995

Continuation-in-part of application No. 08/334,428, filed on Nov. 4, 1994, now Pat. No. 5,834,305, and a continuation-in-part of application No. 08/191,866, filed on Feb. 4, 1994, now Pat. No. 5,783,195, which is a continuation of application No. 08/037,707, filed on Mar. 25, 1993, now abandoned, which is a continuation of application No. 07/649,380, filed on Jan. 31, 1991, now abandoned, which is a continuation of application No. 07/078,519, filed on Jul. 27, 1987, now abandoned. This PCT application Feb. 2, 1995, Appl. No. 379,647.

Int. Cl. A61K *39/265;* **C12N** *7/04;15/63*

U.S. Cl. 424—229.1 **30 Claims**

1. A recombinant infectious bovine rhinotracheitis virus comprising a foreign DNA sequence inserted into an infectious bovine rhinotracheitis viral genome, wherein the foreign DNA sequence is inserted within the BamHI C fragment of the infectious bovine rhinotracheitis viral genome and is capable of being expressed in an infectious bovine rhinotracheitis virus infected host cell.

US 6,410,034 B1

DERMAL ABSORPTION-PROMOTING AGENT

Mitsuo Matsumoto; Makiko Fujii; Yasuhiro Takeda, and Minuro Hanada, all of Tokyo, Japan, assignors to Takasago International Corporation, Tokyo, Japan

Filed Sep. 2, 1999, Appl. No. 388,482

Claims priority, application Japan, Sep. 3, 1998, 10-265652; Oct. 1, 1998, 10-294455

Int. Cl. A61K *7/00;6/00;* **A01N** *31/08*

U.S. Cl. 424—401 **16 Claims**

1. A dermal absorption-promoting agent consisting essentially of p-menthane-3,8-diol and 3-l-menthoxypropane-1,2-diol.

US 6,410,035 B1

EMULSIFIER-FREE FINELY DISPERSE SYSTEMS OF THE OIL-IN-WATER AND WATER-IN-OIL TYPE

Heinrich Gers-Barlag, Kummerfeld, and Anja Müller, Rümpel, both of Germany, assignors to Beiersdorf AG, Hanburg, Germany

Filed Sep. 2, 1999, Appl. No. 389,684

Claims priority, application Germany, Sep. 18, 1998, 198 42 767

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *6/00*

U.S. Cl. 424—401 **9 Claims**

1. A Pickering emulsion, said Pickering emulsion being a finely dispersed water-in-oil or oil-in water system, said Pickering emulsion comprising:

a) anoilphase;

b) an aqueous phase;

c) microfine particles, said microfine particles:

i) having an average particle size of less than 200 nm;

ii) being dispersible both in water and in oil;

iii) having both hydrophilic and lipophilic properties resulting in amphiphilic character; and

iv) being selected from the group consisting of metal oxides, which are coated on the surface thereof with:

(A) a dimethylpolysiloxane and/or silica gel; and

(B) aluminium hydroxide and/or alumina and/or silicon dioxide;

d) at least one polymeric moisturizer; and

e) at most 0.5% by weight of one or more emulsifiers.

US 6,410,036 B1

EUTECTIC MIXTURES IN COSMETIC COMPOSITIONS

Mario De Rosa, and Mose Rossi, both of Naples, Italy, assignors to E-L Management Corp., New York, N.Y.

Filed May 4, 2000, Appl. No. 564,218

Int. Cl. A61K *7/00*

U.S. Cl. 424—401 33 Claims

1. A liquid, substantially anhydrous eutectic mixture comprising a principal acid component and at least one other component selected from the group consisting of a carbohydrate, a polyol, a carbonylic compound, an amino acid, and a carboxylic acid.

US 6,410,037 B1

ANTI-PRURITIC COMPOSITIONS

Raymond De Bony, Ecublens, Switzerland, and Eric Gooris, Neydens, France, assignors to Roche Consumer Health AG, Kaiseraugst, Switzerland

Filed Sep. 11, 2000, Appl. No. 658,896

Claims priority, application European Pat. Off., Sep. 15, 1999, 99118285

Int. Cl. A61K *7/00*

U.S. Cl. 424—401 8 Claims

1. A topical pharmaceutical composition comprising pantothenic acid or a derivative thereof and glycine in a pharmaceutically acceptable carrier, wherein a synergistic weight/weight ratio of the pantothenic acid, or pantothenic acid derivative, to the glycine is between about 0.13 and about 13.3 and wherein the pantothenic acid or pantothenic acid derivative and the glycine are each present in the composition in an amount between about 2% and 5% by weight.

US 6,410,038 B1

WATER-IN-OIL-IN-POLAR SOLVENT EMULSIONS

Zuchen Lin, and William James Schulz, Jr., both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jun. 14, 2000, Appl. No. 593,529

This patent is subject to a terminal disclaimer.

Int. Cl. A01N *25/34;* A61K *7/06;7/11*

U.S. Cl. 424—402 16 Claims

1. A composition comprising a water-in-oil-in-non-aqueous polar solvent W/O/PS multiple emulsion including a water phase W dispersed in an oil O first continuous phase of primary emulsion W/O by an emulsifier, the primary emulsion W/O being dispersed in a second continuous non-aqueous polar solvent phase PS to form multiple emulsion W/O/PS, the emulsifier being a silicone elastomer containing polyether groups which is a network of crosslinked polymeric molecules.

US 6,410,039 B1

PROTECTIVE TOPICAL COMPOSITION, PRODUCTS INCLUDING THE SAME, AND METHODS

Edward B. Walker, Ogden, Utah, assignor to First Scientific, Inc., Ogden, Utah

Filed Sep. 15, 1999, Appl. No. 396,580

Int. Cl. A01N *25/34*

U.S. Cl. 424—404 26 Claims

1. A wet wipe comprising:

an emulsion including:

water;

silicone oil comprising less than 3% to about 0.1% of the weight of said emulsion; and

a combination of at least two non-ionic surfactants to emulsify substantially all of said silicone oil in said water;

a synergistic blend of at least two water soluble preservatives; and

a sheet wetted with said emulsion.

US 6,410,040 B1

POLYMERIC COMPOUNDS AND METHODS OF FORMULATING SAME

Graham John Hamilon Melrose, Dalkeith, and Andrew James Huxham, Balga, both of Australia, assignors to Chemeq Limited, Bentley, Australia

PCT No. PCT/AU99/00578, § 371 Date Nov. 28, 2000, § 102(e) Date Nov. 28, 2000, PCT Pub. No. WO00/03723, PCT Pub. Date Jan. 27, 2000

PCT Filed Jul. 16, 1999, Appl. No. 701,311

Claims priority, application Australia, Jul. 17, 1998, PP 4719; Aug. 10, 1998, PP 5167

Int. Cl. A01N *25/00;* A61K *7/00;7/42;31/74*

U.S. Cl. 424—404 28 Claims

1. A method for the preparation of compositions of poly(2-propenal, 2-propenoic acid) comprising the method steps of dissolving the poly(2-propenal, 2-propenoic acid) in aqueous base, adding an organic compound containing one or more hydrophobic groups, and subsequently acidifying the solution, whereby interaction between the hydrophobic groups of the organic compound and the poly(2-propenal, 2-propenoic acid) prevents precipitation of the poly(2-propenal, 2-propenoic acid) occurring at pH≧5.5 and the solution is consequently stable over a broad pH range.

US 6,410,041 B1

CULTURING CELLS IN PRESENCE OF AMPHIPATHIC WEAK BASES AND/OR CATIONS AND MULTIPLE DRUG RESISTANCE INHIBITOR CONTAINING RESERPINE

Kim Lewis, Newton, and Peichun Hsieh, Cambridge, both of Mass., assignors to Trustees of Tufts College, Boston, Mass.

Filed Apr. 28, 1998, Appl. No. 67,873

Int. Cl. A01N *25/00;43/48;63/00;65/00;* C12N *1/00*

U.S. Cl. 424—405 30 Claims

1. A method for increasing the accumulation of amphipathic weak bases, amphipathic cations, or both, in a cell, comprising the step of culturing said cell in the presence of said amphipathic weak bases, amphipathic cations, or both, and a multiple drug resistance inhibitor comprising reserpine in a medium with a pH of about 9.

US 6,410,042 B1

PLANT PROTECTION PRODUCTS IN THE FORM OF A GRANULATE WITH CONTROLLED RELEASE OF THE ACTIVE AGENT

Manfred Schroeder, Neustadt; Reiner Kober, Fussgönheim; Reinhold Stadler, Kirrweiler; Jörn Tidow, Schwetzingen; Norbert Sendhoff, Grünstadt, and Erich Probeck, Bockenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP98/04095, § 371 Date Jan. 11, 2000, § 102(e) Date Jan. 11, 2000, PCT Pub. No. WO99/04634, PCT Pub. Date Feb. 4, 1999

PCT Filed Jul. 2, 1998, Appl. No. 462,676

Claims priority, application Germany, Jul. 23, 1997, 197 31 528

Int. Cl. A01N *25/12*

U.S. Cl. 424—421 9 Claims

1. Crop protection granules comprising a core of tetrahydro-3,5-dimethyl-1,3,5-thiadiazine-2-thione as an active substance and an outer shell, the proportion of the outer shell being from 0.1 to 50% by weight, based on the weight of the entire granules, wherein at least 50% by weight of the shell consists of elemental sulfur.

US 6,410,043 B1

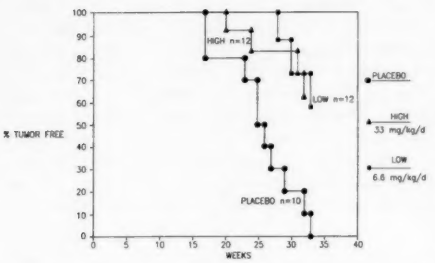
METHOD FOR CHEMOPREVENTION OF PROSTATE CANCER

Mitchell S. Steiner, Germantown, and Sharan Raghow, Collierville, both of Tenn., assignors to The University of Tennessee Research Corporation, Knoxville, Tenn.

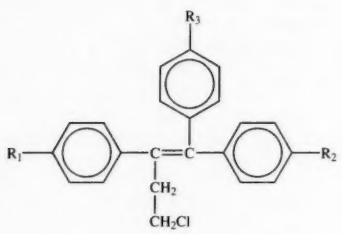
Continuation-in-part of application No. 09/531,472, filed on Mar. 20, 2000, which is a continuation-in-part of application No. 09/436,208, filed on Nov. 8, 1999, which is a continuation-in-part of application No. 09/306,958, filed on May 7, 1999, Provisional application No. 60/084,602, filed on May 7, 1998. This application Sep. 12, 2000, Appl. No. 660,191.

Int. Cl. A61F *13/00;* **A61K** *9/14;9/20;9/48*

U.S. Cl. 424—422 **17 Claims**



1. A method of suppressing or inhibiting latent prostate cancer of a subject comprising the steps of: administering to the subject a pharmaceutical composition comprising a compound having the formula:



(I)

wherein R_1 and R_2, which can be the same or different, are H or OH; R_3 is $OCH_2CH_2NR_4R_5$, wherein R_4 and R_5, which can be the same or different, are H or an alkyl group of 1 to about 4 carbon atoms; and their pharmaceutically acceptable salts, esters, or N-oxides, and mixtures thereof.

US 6,410,044 B1

CROSSLINKABLE MACROMERS

Stephen J. Chudzik, St. Paul, and David L. Clapper, Shorewood, both of Minn., assignors to Surmodics, Inc., Eden Prairie, Minn.

Continuation-in-part of application No. 09/469,976, filed on Dec. 21, 1999, now Pat. No. 6,156,345, which is a division of application No. 09/121,248, filed on Jul. 23, 1998, now Pat. No. 6,007,833, Provisional application No. 60/078,607, filed on Mar. 19, 1998. This application May 16, 2000, Appl. No. 571,525.

Int. Cl. A61F *2/06;2/28;13/00;47/30*

U.S. Cl. 424—423 **20 Claims**

1. A method of delivering an implant article to a tissue site, the method comprising

a) providing an implant article selected from the group consisting of tissue implants and prosthetic devices providing a porous surface,

b) providing a matrix-forming system comprising a polymerization initiator and a crosslinkable macromer comprising one or more polymers having pendent polymerizable groups,

c) implanting the article within the tissue site with the matrix-forming system positioned between the article and the tissue site, and

d) polymerizing the matrix-forming system to form a crosslinked matrix between the article and the tissue site suitable to permit continuous tissue growth through the matrix and between the implant article and the tissue site.

US 6,410,045 B1

DRUG DELIVERY SYSTEM FOR ANTIGLAUCOMATOUS MEDICATION

Clyde Lewis Schultz, 141 Tremont St., Boston, Mass. 02111, and Janet M. Mint, 209 Seamist Ct., Ponte Vedra, Fla. 32082

Provisional application No. 60/121,019, filed on Feb. 22, 1999. This application Feb. 19, 2000, Appl. No. 507,437.

Int. Cl. A61K *9/00*

U.S. Cl. 424—429 **18 Claims**

1. A drug delivery system comprising a polymeric hydrogel contact lens containing timolol maleate in a concentration of between 0.05% and 0.25% by weight absorbed in said contact lens which is capable of being delivered into the ocular fluid.

US 6,410,046 B1

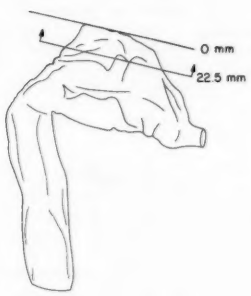
ADMINISTERING PHARMACEUTICALS TO THE MAMMALIAN CENTRAL NERVOUS SYSTEM

Eduard N. Lerner, Amsterdam, Netherlands, assignor to Intrabrain International NV, Curacao, Netherlands Antilles

Continuation-in-part of application No. 09/077,123, filed on May 20, 1998, and a continuation of application No. PCT/EP96/05086, filed on Nov. 19, 1995. This application Nov. 20, 1998, Appl. No. 197,133.

Int. Cl. A61F *13/00;2/00;* **A61K** *9/00*

U.S. Cl. 424—434 **9 Claims**



1. A method of delivering a pharmaceutical composition to the central nervous system of a mammal, comprising the steps of:

(a) administering said pharmaceutical composition to the central nervous sytstem (CNS) transnasal-mucosally with electrotransport by application of an electrotransport driving force in the olfactory region to advance the composition through nasal mucosa, bypassing vasculature, to reach CNS; and

(b) enhancing delivery of said pharmaceutical composition with a chemical permeation enhancer applied to the nasal mucosa.

US 6,410,047 B1

INDIVIDUALLY DOSED FOIL-FORM PRESENTATION WHICH DECOMPOSES RAPIDLY ON CONTACT WITH LIQUID AND CONTAINS AN ACTIVE SUBSTANCE, IN PARTICULAR AN AROMATIC SUBSTANCE

Michael Horstmann, Neuwied, and Wolfgang Laux, Diez, both of Germany, assignors to LTS Lohmann Therapie-Systeme AG, Germany

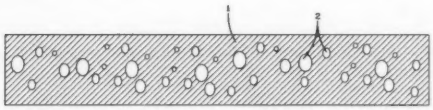
PCT No. PCT/EP97/06533, § 371 Date Jul. 15, 1999, § 102(e) Date Jul. 15, 1999, PCT Pub. No. WO98/26764, PCT Pub. Date Jun. 25, 1998

PCT Filed Nov. 21, 1997, Appl. No. 319,909

Claims priority, application Germany, Dec. 16, 1996, 196 52 257

Int. Cl. A61K *9/70;9/127;9/14;* A61F *13/00;* C12C *7/26*

U.S. Cl. 424—443 10 Claims



1. Individual film shaped dosage form of liposoluble liquid flavors and fragrances which form rapidly disintegrates upon contact with a water containing liquid, said dosage form consisting essentially of an inner phase of liposoluble liquid droplets of between less the 1 μm and 100 μm distributed within an outer, solid, water-soluble phase, said outer phase containing at least 40% (w/w) polyvinyl alcohol and 0 to 30% (w/w) of a surfactant, and the constituent amount of the said inner phase, relative to the said outer phase, when both phases are water free, is between 0.1 and 30% (w/w), wherein said liposoluble liquid droplets are flavors and fragrances.

US 6,410,048 B1

PROLAMIN-PLANT POLAR LIPID COMBINATION, PREPARATION METHOD AND APPLICATIONS

Spiros Fotinos, Athens, Greece, assignor to Laboratories Lavipharm S.A., Paris, France

PCT No. PCT/FR98/02400, § 371 Date Jul. 18, 2000, § 102(e) Date Jul. 18, 2000, PCT Pub. No. WO99/25326, PCT Pub. Date May 27, 1999

PCT Filed Nov. 10, 1998, Appl. No. 554,486

Claims priority, application France, Nov. 13, 1997, 97 14242

This patent is subject to a terminal disclaimer.

Int. Cl. A61L *15/44*

U.S. Cl. 424—447 28 Claims

1. A patch comprising a backing film, a removable layer and an association layer between the backing film and the removable layer; wherein the association layer comprises prolamine and plant polar lipid, wherein the prolamine and the plant polar lipid are provided in proportions sufficient to enable formation of a stable patch, and wherein the patch exhibits skin adhesion properties.

US 6,410,049 B1

PREPARATION OF STABLE FORMULATIONS OF LIPID-NUCLEIC ACID COMPLEXES FOR EFFICIENT IN VIVO DELIVERY

Demetrios Papahadjopoulos; Keelung Hong, and Weiwen Zheng, all of San Francisco, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Division of application No. 08/967,791, filed on Nov. 10, 1996, now Pat. No. 6,071,533, Provisional application No. 60/030,578, filed on Nov. 12, 1996. This application Oct. 20, 1999, Appl. No. 420,908.

Int. Cl. A61K *9/127*

U.S. Cl. 424—450 11 Claims

1. A kit for preparing a lipid:nucleic acid complex, said kit comprising:

(i) a container containing a liposome;

(ii) a container containing a nucleic acid; wherein the liposome and the nucleic acid are mixed to form the lipid:nucleic acid complex, and

(iii) a container containing a hydrophilic polymer in an amount such that when said lipid:nucleic acid complex and the hydrophilic polymer are mixed, the result is a molar ratio of about 0.1 to about 10% hydrophilic polymer to lipid within the lipid:nucleic acid complex.

US 6,410,050 B1

CELLULOSE CAPSULE USING MIXED SOLUTION OF PECTIN AND GLYCERIN AND THE MANUFACTURING PROCESS THEREOF

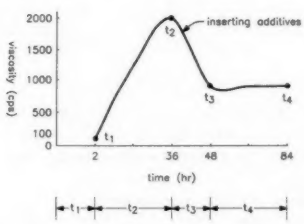
Joo Hwan Yang, Bucheon, Rep. of Korea, assignor to Suheung Capsule Co., Ltd., Bucheon, Rep. of Korea

Filed Apr. 6, 2000, Appl. No. 544,115

Claims priority, application Rep. of Korea, Mar. 6, 2000, 2000-10990

Int. Cl. A61K *9/48;9/64*

U.S. Cl. 424—451 12 Claims



1. A process for preparing a cellulose capsule, which process comprises the following steps:

i) preparing a mixed solution of pectin and glycerin;

ii) adding the mixed solution to an aqueous solution of solubilized cellulose;

iii) adding glacial acetic acid, calcium gluconate and sucrose fatty acid ester to the resulting admixture; and

iv) allowing the thus-obtained product to stand, adjusting its viscosity, and forming a capsule from it.

US 6,410,051 B1

COMPRESSED CHLORAMINE-T TABLETS AND METHOD FOR THE PRODUCTION THEREOF

Rolf Georg, and Hartmut Bosch, both of Ammerbuch, Germany, assignors to RMP chemisch-technische Spezialprodukte GmbH and Co. KG, Ammerbuch, Germany

PCT No. PCT/EP98/05466, § 371 Date May 11, 2000, § 102(e) Date May 11, 2000, PCT Pub. No. WO99/11126, PCT Pub. Date Mar. 11, 1999

PCT Filed Aug. 28, 1998, Appl. No. 486,793

Claims priority, application Germany, Sep. 3, 1997, 197 38 424; Dec. 12, 1997, 197 55 258

Int. Cl. A61K *9/20;9/14*

U.S. Cl. 424—464 **24 Claims**

1. Compressed tablets containing more than 80 wt. % of chloramine-T as the main constituent and at least one pressing agent and at least one agent assisting rapid dissolving as secondary constituents.

US 6,410,052 B1

TEA CATECHINS IN SUSTAINED RELEASE FORMULATIONS AS CANCER SPECIFIC PROLIFERATION INHIBITORS

Dorothy M. Morré; D. James Morré, both of West Lafayette, Ind.; Raymond Cooper, Mountain View, and Michael N. Chang, Brisbane, both of Calif., assignors to Purdue Research Foundation, West Lafayette, Ind., and Pharmanex, Inc., Brisbane, Calif.

Continuation-in-part of application No. 09/537,211, filed on Mar. 29, 2000, Provisional application No. 60/151,109, filed on Aug. 27, 1999, Provisional application No. 60/126,893, filed on Mar. 30, 1999. This application Aug. 10, 2000, Appl. No. 637,840.

Int. Cl. A61K *9/22;35/78;31/35;31/05*

U.S. Cl. 424—468 **30 Claims**

1. A composition of a sustained release formulation of tea catechins comprising tea catechins and at least one component which controls the release of said catechins, comprising EGCg and EC catechins wherein, EGCg comprises at least 0.01% of said catechins, and the EC content is at least 10 fold greater than the EGCg content.

US 6,410,053 B1

REVERSIBLE CROSS-LINKED GEL

Margaret Joan Taylor, Hoton Nr Loughborough, United Kingdom, assignor to De Montfort University, England, United Kingdom

Continuation of application No. 08/569,119, filed as application No. PCT/GB94/01384, filed on Jun. 27, 1994. This application Jul. 29, 1998, Appl. No. 124,445.

Claims priority, application United Kingdom, Jun. 30, 1993, 9313484

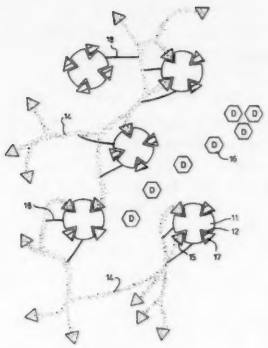
This patent is subject to a terminal disclaimer.

Int. Cl. A61K *9/10;47/42;47/36*

U.S. Cl. 424—488 **20 Claims**

1. A method for producing a drug system for delivering a drug for the treatment of a condition, comprising the steps of:

providing a macromolecule having a plurality of binding sites for a physiological moiety;



providing a polymeric cross linking agent having a plurality of said physiological moieties bound at terminal positions;

anchoring the macromolecule to the polymeric cross linking agent by a covalent bond;

providing the drug; and

combining the drug with the macromolecule bonded to the polymeric cross linking agent, whereby the plurality of binding sites bind to the plurality of physiological moieties to form a gel matrix having a conformation which reversibly immobilizes the drug, wherein the gel matrix undergoes a conformational change upon exposure to free said physiological moieties thereby mobilizing the drug.

US 6,410,054 B1

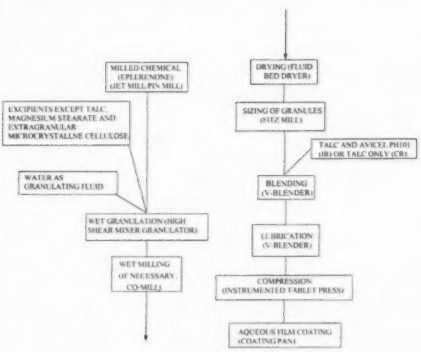
IMMEDIATE RELEASE EPLERENONE COMPOSITIONS

Shilpa S. Thosar, Des Plaines; Rajeev D. Gokhale, Waukegan, and Dwain S. Tolbert, Wadsworth, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Provisional application No. 60/111,646, filed on Dec. 9, 1998. This application Dec. 8, 1999, Appl. No. 456,614.

Int. Cl. A61K *9/36*

U.S. Cl. 424—489 **65 Claims**


MILLED CHEMICAL (EPLERENONE) (JET MILL/PIN MILL)
EXCIPIENTS EXCEPT TALC MAGNESIUM STEARATE AND EXTRAGRANULAR MICROCRYSTALLINE CELLULOSE
WATER AS GRANULATING FLUID
WET GRANULATION (HIGH SHEAR MIXER GRANULATOR)
WET MILLING (IF NECESSARY, CO-MILL)
DRYING (FLUID BED DRYER)
SIZING OF GRANULES (SIZE MILL)
TALC AND AVICEL PH101 (IR) OR TALC ONLY (CR)
BLENDING (V-BLENDER)
LUBRICATION (V-BLENDER)
COMPRESSION (INSTRUMENTED TABLET PRESS)
AQUEOUS FILM COATING (COATING PAN)

1. A pharmaceutical composition comprising (a) particulate eplerenone having a D_{90} particle size of about 25 to about 400 microns, in an amount of about 10 mg to about 1000 mg, and (b) one or more pharmaceutically acceptable carrier materials; said composition being an immediate release composition wherein about 50% of said eplerenone is dissolved in vitro within about 15 minutes in a 1% sodium dodecyl sulfate solution at 37° C.

US 6,410,055 B1

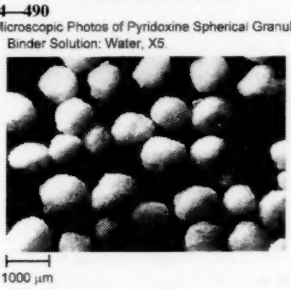
SPHERICAL PHARMACEUTICAL GRANULES COMPRISING MICROCRYSTALLINE CELLULOSE AND A PROCESS FOR THEIR PRODUCTION

Hidero Akiyama, Tokyo; Zene Matsumoto, and Takashi Ueno, both of Gunma, all of Japan, assignors to Novartis International Pharmaceutical Ltd., Hamilton, Bermuda

Division of application No. 09/029,948, filed as application No. PCT/JP96/02504, filed on Sep. 4, 1996, now Pat. No. 6,242,008. This application Jul. 26, 2000, Appl. No. 626,403. Claims priority, application United Kingdom, Sep. 9, 1995, 9518465

Int. Cl. A61K *9/14;9/16*

U.S. Cl. 424—490 **7 Claims**



1. A method of preparing substantially spherical granules of caffeine or acyclovir for pharmaceutical use, which method comprises introducing a mixture consisting essentially of approximately 25% caffeine or acyclovir and 75% microcrystalline cellulose as the sole excipient into a high speed agitation granulator and spraying on water or a mixture of ethanol and water as a binder solution.

US 6,410,056 B1

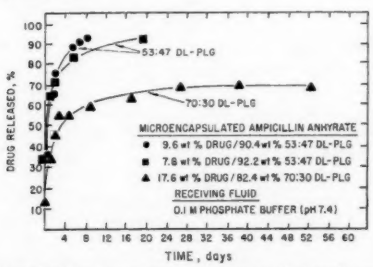
CHEMOTHERAPEUTIC TREATMENT OF BACTERIAL INFECTIONS WITH AN ANTIBIOTIC ENCAPSULATED WITHIN A BIODEGRADABLE POLYMERIC MATRIX

Jean A. Setterstrom; Elliot Jacob, both of Silver Spring, Md., and Thomas R. Tice, Birmington, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of application No. 08/209,350, filed on Jan. 7, 1994, now abandoned, which is a continuation-in-part of application No. 07/493,597, filed on Mar. 15, 1990, now abandoned, which is a continuation-in-part of application No. 06/590,308, filed on Mar. 16, 1984, now abandoned. This application May 22, 1995, Appl. No. 446,148.

Int. Cl. A61K *9/50;47/30;* **B32B** *5/16*

U.S. Cl. 424—501 **47 Claims**


DRUG RELEASED, %
TIME, days
53:47 DL-PLG
70:30 DL-PLG
MICROENCAPSULATED AMPICILLIN ANHYRATE
9.6 wt % DRUG/90.4 wt % 53:47 DL-PLG
7.6 wt % DRUG/92.2 wt % 53:47 DL-PLG
17.6 wt % DRUG/82.4 wt % 70:30 DL-PLG
RECEIVING FLUID
0.1 M PHOSPHATE BUFFER (pH 7.4)

1. A method for the protection against or therapeutic treatment of bacterial infection in the tissue of a human or nonhuman animal comprising administering locally to said animal a bactericidally-effective amount of a pharmaceutical composition consisting essentially of an antibiotic encapsulated within a biodegradable comprising poly (DL-lactide-co-glycolide) matrix wherein the duration of controlled release of the antibiotic is within a period of about 14 days to about 6 weeks.

US 6,410,057 B1

BIODEGRADABLE MIXED POLYMERIC MICELLES FOR DRUG DELIVERY

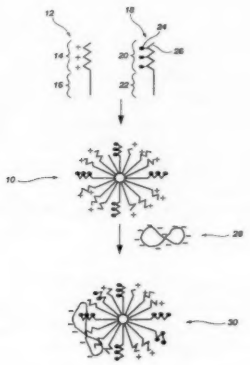
Young Kweon-Choi, Taejeon, and Jin Seok Kim, Seoul, both of Rep. of Korea, assignors to Samyang Corporation, Taejon, Rep. of Korea

Continuation-in-part of application No. 09/209,631, filed on Dec. 11, 1998, now Pat. No. 6,210,717, Provisional application No. 60/069,551, filed on Dec. 12, 1997. This application Nov. 16, 2000, Appl. No. 713,904.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *9/50*

U.S. Cl. 424—501 **53 Claims**



1. A carrier for delivery of a bioactive molecule into a host cell comprising a mixture of an amphiphilic polyester-polycation copolymer and an amphiphilic polyester-sugar copolymer.

US 6,410,058 B2

METHODS OF USE FOR DIETARY COMPOSITIONS COMPRISING LACTOFERRIN AND COLOSTRUM

Marcus B. Gohlke, 12302 Astoria Blvd., Houston, Tex. 77089, and Richard H. Cockrum, Intersection Highway 141 and 169, Perry, Iowa 50220

Division of application No. 09/370,654, filed on Aug. 6, 1999, now Pat. No. 6,258,383, Provisional application No. 60/096,697, filed on Aug. 14, 1998. This application Feb. 6, 2001, Appl. No. 778,294.

Int. Cl. A61K *35/20;35/78;9/20*

U.S. Cl. 424—535 **8 Claims**

1. A method of promoting in humans a stimulation of immune function, wherein the method comprises the administration of an effective amount of a dietary composition comprising modified citrus pectin, lactoferrin and dehydrated colostrum, wherein the composition is prepared as a lozenge, a chewable lozenge, a chewable tablet, or a chewable gum.

US 6,410,059 B1

PHARMACEUTICAL COMPOSITION CONTAINING COW URINE DISTILLATE AND AN ANTIBIOTIC

Suman Preet Singh Khanuja; Sushil Kumar; Ajit Kumar Shasany; Jai Shankar Arya; Mahendra Pandurang Darokar; Monika Singh; Prachi Sinha; Soumya Awasthi; Subhash Chandra Gupta; Vivek Kumar Gupta; Madan Mohan Gupta; Ram Kishore Verma; Sweta Agarwal, all of Lucknow; Sunil Balkrishna Mansinghka, and Suresh Haribhau Dawle, both of Nagpur, all of India, assignors to Council of Scientific and Industrial Research, New Delhi, India

Provisional application No. 60/241,842, filed on Oct. 20, 2000.
This application Dec. 1, 2000, Appl. No. 726,307.
Int. Cl. A61K *35/22*
U.S. Cl. 424—558 **16 Claims**

1. A pharmaceutical composition comprising an antibiotic and cow urine distillate in an amount effective to enhance antimicrobial effect of said antibiotic.

US 6,410,060 B1

METHOD FOR THE IODINE FORTIFICATION OF EGGS

Pichit Suvanprakorn; Lerson Tanasugarn; Anusig Limahksohn; Sangsom Sinawat, and Prakrom Vuthipongse, all of Bangkok, Thailand, assignors to Biophile Corporation, Bangkok, Thailand

Filed May 19, 1998, Appl. No. 81,494
Int. Cl. A61K *33/18;47/00;35/54;* **A23L** *1/32;* **A23B** *5/18*
U.S. Cl. 424—668 **9 Claims**

1. A method of non-invasively fortifying an egg which includes a yolk, albumen, and a surrounding shell, said method comprising contacting the egg shell with a solution of a solute selected from the group consisting of iodide and iodate salts of alkali metals and alkaline-earth metals and having a pH of 5.0 to 7.5, at a temperature between 20 and 30 degrees Celsius for a sufficient period of time to cause said solute to penetrate the shell and enter the egg.

US 6,410,061 B1

TEA CATECHINS AS CANCER SPECIFIC PROLIFERATION INHIBITORS

Dorothy M. Morré, and James D. Morré, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Provisional application No. 60/151,109, filed on Aug. 27, 1999,
Provisional application No. 60/126,893, filed on Mar. 30, 1999.
This application Mar. 29, 2000, Appl. No. 537,211.
Int. Cl. A61K *35/78;31/35*
U.S. Cl. 424—729 **33 Claims**

1. A method for treating cancer in a mammal which comprises administering to a mammal in need of cancer treatment, wherein the cancer is a type having cancer cells which express tNOX, a therapeutically effective amount of a composition comprising tea catechins, wherein said composition comprises more than one tea catechin, and wherein EGCg comprises about 40% of the catechins and ECG comprises about 15% of the catechins.

US 6,410,062 B1

METHOD FOR THE TOPICAL TREATMENT AND PREVENTION OF INFLAMMATORY DISORDERS AND RELATED CONDITIONS USING EXTRACTS OF FEVERFEW (*TANACETUM PARTHENIUM*)

Theresa Callaghan, Ax Delft, Netherlands; Thierry Oddos, Meudon, France; Gerard Gendimenico, Neshanic Station, and Katharine Martin, Ringoes, both of N.J., assignors to Johnson & Johnson Consumer France SAS I3540, France

Provisional application No. 60/137,332, filed on Jun. 3, 1999.
This application Jun. 2, 2000, Appl. No. 586,587.
Int. Cl. A61K *35/78*
U.S. Cl. 424—764 **20 Claims**

1. A method of treating inflammatory disorders and related conditions which comprises topically applying a composition comprising an effective amount of an extract of feverfew to a patient wherein said extract is substantially free of α-unsaturated γ-lactone.

US 6,410,063 B1

COMPOSITION AND METHOD

Dennis Edward Jewell, Topeka; Claudia Ann Kirk, Lawrence; Philip William Toll, Valley Falls, and Steven Curtis Zicker, Lawrence, all of Kans., assignors to Hill's Pet Nutrition, Inc., Topeka, Kans.

Filed Jun. 13, 2000, Appl. No. 592,697
Int. Cl. A23K *1/18*
U.S. Cl. 426—2 **11 Claims**

1. A method for inducing a state of ketosis in a canine which comprises feeding to a canine in need of such ketosis on a regular basis a diet comprising carbohydrate measured as nitrogen free extract of about 0 to about 20 wt. % of the diet, protein of about 25 to about 70 wt. % of the diet, and fat of about 20 wt. % to about 70 wt. % of the diet on a dry matter basis.

US 6,410,064 B1

METHOD OF PROCESSING SOYBEAN BY USE OF A PECTINASE, PROCESSED SOYBEAN OBTAINED, AND FOOD CONTAINING THE PROCESSED SOYBEAN

Toru Akazawa, 5-45-1001, Mukogawa-cho, Takarazuka-shi, Hyogo 665-0844, Japan, assignor to Toru Akazawa, Hyogo, Japan

PCT No. PCT/JP99/04258, § 371 Date Apr. 3, 2000, § 102(e) Date Apr. 3, 2000, PCT Pub. No. WO01/10242, PCT Pub. Date Feb. 15, 2001
PCT Filed Aug. 6, 1999, Appl. No. 508,532
Int. Cl. A23L *1/20*
U.S. Cl. 426—46 **34 Claims**

1. A method of processing soybean by use of an enzyme, which comprises the steps of:

soaking the soybean in water;

heating the soybean in the presence of water;

cooling the heated soybean;

performing an enzyme treatment by adding water and a pectinase produced by microorganisms of the genus Bacillus to the soybean to obtain a first mixture, and agitating the first mixture for a predetermined time period to thereby obtain a slurry, in which single cells of the soybean are dispersed;

after said enzyme treatment, inactivating the pectinase;

preparing a second mixture by mixing said slurry with a powder of a pulse other than the soybean; and

drying said second mixture by means of flash drying or spray drying to obtain a processed soybean powder.

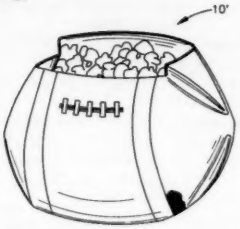
US 6,410,065 B1
EXPANSIBLE FOOD CONTAINER

John R. Nottingham; John W. Spirk, Jr., both of Moreland Hills, and Dale Panasewicz, Strongsville, all of Ohio, assignors to Nottingham-Spirk Design Associates, Inc., Cleveland, Ohio

Continuation-in-part of application No. 07/475,420, filed on Feb. 5, 1990, now abandoned, which is a continuation-in-part of application No. 07/331,081, filed on Mar. 27, 1989, now Pat. No. 4,898,561, which is a continuation of application No. 07/103,025, filed on Sep. 30, 1987, now abandoned, which is a continuation of application No. 06/879,915, filed on Jun. 27, 1986, now abandoned. This application Jun. 23, 1992, Appl. No. 902,957.

Int. Cl. B65B *25/22*

U.S. Cl. 426—87 **18 Claims**



14. A microwave popcorn package comprising at least two flexible non-planar sheets of material having peripheral edges bonded together to form at inflatable cavity for containing popcorn, said sheets of material being cut and bonded together in a configuration which resembles a sports ball when the cavity is inflated by gas generated by microwave cooking of the popcorn.

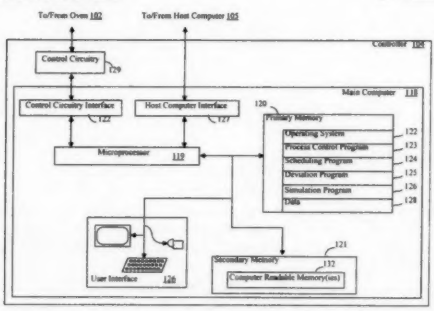
US 6,410,066 B1
CONTROLLER AND METHOD FOR ADMINISTERING AND PROVIDING ON-LINE HANDLING OF DEVIATIONS IN A CONTINUOUS OVEN COOKING PROCESS

Zhijun Weng, Fresno, Calif., assignor to FMC Technologies, Inc., Chicago, Ill.

Continuation-in-part of application No. 09/188,531, filed on Nov. 6, 1998, and a continuation-in-part of application No. 09/187,915, filed on Nov. 6, 1998. This application Apr. 28, 2000, Appl. No. 560,637.

Int. Cl. A01K *43/00;* **G01N** *33/02*

U.S. Cl. 426—231 **19 Claims**



1. A method of administering a continuous oven cooking process in an oven on a continuous line of food items, the method comprising the steps of:

controlling the oven to perform the continuous oven cooking process according to scheduled parameters; and

in response to a deviation in a specific one of the scheduled parameters, identifying specific ones of the food items that have (a) currently predicted accumulated lethalities predicted to be delivered to them during the continuous oven cooking process that are less than a target lethality and/or (b) core temperatures at their cores at the end of the continuous oven cooking process that are less than a target core temperature.

US 6,410,067 B1
EQUINE NEUTRACEUTICALS

Morton Jay Kanter, 103 S. Dawson Ave., Columbus, Ohio 43209, and Lynn E. Taylor, 4461 S. Old 3C Hwy., Westerville, Ohio 43082

Provisional application No. 60/178,344, filed on Jan. 27, 2000. This application Nov. 8, 2000, Appl. No. 708,861.

Int. Cl. A23K *1/18*

U.S. Cl. 426—272 **6 Claims**

1. An equine feed pellet composition, comprising:

(a) between about 20% to 50% by weight total oil content of which between about 50% and 100% thereof is oat oil;

(b) up to about 9% by weight conjugated linoleic acid isomer mixture; and

(c) protein isolate.

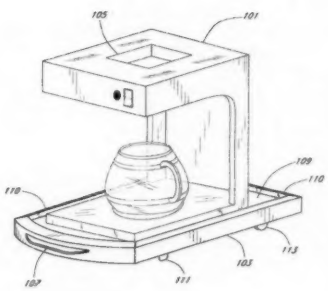
US 6,410,068 B2
METHOD FOR BREWING COFFEE USING A RELOCATABLE COFFEE MAKER

Joseph P. Goldston, 21668 Jade Woods Dr., Bristol, Va. 24202

Division of application No. 09/345,184, filed on Jun. 30, 1999, now Pat. No. 6,240,830. This application Jun. 1, 2001, Appl. No. 872,697.

Int. Cl. A23F *5/00*

U.S. Cl. 426—433 **5 Claims**



1. A method of brewing coffee, by using a coffee maker that is positioned in a first location on a counter, comprising:

lifting a handle that is attached to the coffee maker to tilt the coffee maker;

rolling the coffee maker, while the coffee maker is tilted, to a second position on said counter;

lowering the handle to provide the coffee maker in the second position on said counter;

filling water in the coffee maker;

lifting the handle to tilt the coffee maker;

rolling the coffee maker, while the coffee maker is tilted, to the first position on said counter;

lowering the handle to provide the coffee maker in the first position on said counter; and

brewing coffee by activating the coffee maker in said first position.

US 6,410,069 B1

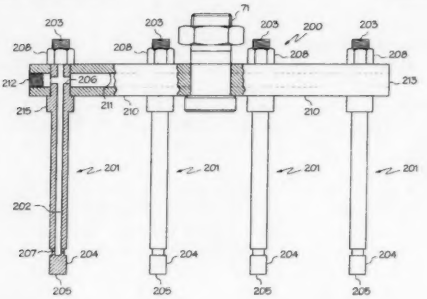
METHOD FOR DECONTAMINATING A DRUPE

Efren Castro, 80800 Avenue 60th, La Quinta, Calif. 92253

Division of application No. 09/126,470, filed on Jul. 30, 1998, now Pat. No. 5,992,310. This application Nov. 24, 1999, Appl. No. 448,799.

Int. Cl. A23L *1/015*

U.S. Cl. 426—484 **7 Claims**



1. A method of cleansing contaminants from within a drupe, comprising,

(i) inserting a pitting knife within the drupe,

(ii) ejecting a pit from within the drupe leaving a pitted passage therethrough,

(iii) flowing a decontaminant fluid through a longitudinal passage in the pitting knife while the pitting knife is within the passage, and,

(iv) discharging the fluid from the knife in a generally radial direction only, to contact walls of the pitted passage and remove the contaminants therein, such that contaminants within the passage are flushed out of the drupe.

US 6,410,070 B2

METHOD FOR REDUCING THE DEGRADABILITY OF ANIMAL FEED PROTEIN

Josef Dahlén, Karlshamn; Lars Lindh, Hässelholm, and Claes Münter, Västra Frölunda, all of Sweden, assignors to GEA Evaporation Technologies AB, Göteborg, Sweden

Continuation of application No. PCT/SE97/01198, filed on Jul. 2, 1997. This application Dec. 30, 1998, Appl. No. 222,872.

Claims priority, application Sweden, Jul. 5, 1996, 9602661

Int. Cl. A23B *7/005;9/02;* **A23L** *1/20*

U.S. Cl. 426—511 **16 Claims**

1. A method for reducing the degradability of a protein contained in a vegetable animal feed for ruminants by a method which consists essentially of subjecting a vegetable animal feed to a heat treatment step by turbulently exposing at a Reynolds number of 10^6–10^7, said animal feed to steam having a saturation temperature ranging from 130 to 170° C. at a pressure ranging from 200 to 600 kPa for a time period ranging from 5 seconds to 2 minutes.

US 6,410,071 B1

METHOD AND CONTROL SYSTEM FOR CONTROLLING PASTEURIZATION

Louis S. Polster, 2205 Marthas Rd., Alexandria, Va. 22307

Filed Jul. 10, 2000, Appl. No. 613,510

Int. Cl. A23L *3/00*

U.S. Cl. 426—521 **2 Claims**

1. A method of controlling pasteurization of a food product, comprising:

(a) preheating the product to a predetermined initial temperature;

(b) further heating the product by contact with a heated fluid while maintaining a temperature of the heated fluid at a substantially constant temperature while the product is in contact with the heated fluid;

(c) maintaining the product in contact with the heated fluid for a predetermined time, wherein the predetermined time is a function of a log kill rate of at least one microorganism in the product at the temperature of the heated fluid and a desired log kill level; and

(d) removing the product from contact with the heated fluid at an end of the predetermined time.

US 6,410,072 B1

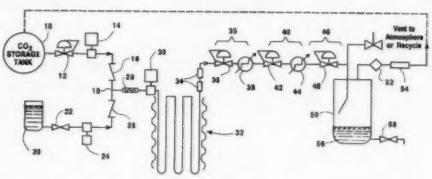
METHOD AND APPARATUS FOR CONTINUOUS FLOW REDUCTION OF MICROBIAL AND/OR ENZYMATIC ACTIVITY IN A LIQUID PRODUCT USING CARBON DIOXIDE

Richard E. Wildasin; James Forbes, both of Lockport; Raymond J. Robey, and Armand J. Paradis, both of Naperville, all of Ill., assignors to University of Florida Research Foundation, Inc., Gainesville, Fla.

Continuation-in-part of application No. 09/314,945, filed on May 20, 1999, now abandoned, Provisional application No. 60/095,967, filed on Aug. 10, 1998. This application Jul. 11, 2000, Appl. No. 613,714.

Int. Cl. A23L *3/00*

U.S. Cl. 426—521 **47 Claims**



24. A continuous method for reducing microorganisms in a liquid product, said method comprising the steps of:

a) combining a pressurized flow of said liquid product with a flow of pressurized liquefied carbon dioxide to create a pressurized mixture in a flow state, said carbon dioxide at a pressure sufficient to maintain it in a liquid state and at a temperature which does not freeze said liquid product;

b) flowing said pressurized mixture through a reaction zone for a sufficient time to reduce microorganisms in said liquid product;

c) feeding said pressurized mixture from said reaction zone through plural expansion stages wherein the pressure of said mixture flow is decreased to vaporize the liquefied carbon dioxide in said mixture flow; and

d) applying heat in at least some of said expansion stages to said mixture flow to prevent a cooling of said carbon dioxide from causing a freezing of said liquid product.

US 6,410,073 B1

MICROWAVEABLE SPONGE CAKE

Andrew E. McPherson, Mt. Prospect; Weizhi Chen, Northfield; Ahmad Akashe, Mundelein, and Miranda Miller, Arlington Heights, all of Ill., assignors to Kraft Foods Holdings, Inc., Northfield, Ill.

Filed Oct. 4, 2000, Appl. No. 679,483

Int. Cl. A21D *13/08*

U.S. Cl. 426—549 **14 Claims**

1. A microwaveable mesophase gel-containing cake comprising a cake batter comprising about 5 to about 15 percent of a mesophase gel; about 10 to about 30 percent maltodextrin; about 10 to about 30 percent cake flour; about 1.0 to about 5.0 starch, about 5 to about 20 percent sugar; about 0.5 to about 5.0 percent egg product; about 0.5 to about 2.0 percent salt; 0 to about 1.0 percent flavoring; and about 25 to about 45 percent water, wherein

the cake batter does not contain a conventional leavening agent and wherein the cake batter, when cooked in a microwave oven, rises and forms a cake.

US 6,410,074 B1

METHOD FOR MAKING A MICROWAVEABLE SPONGE CAKE

Andrew E. McPherson, Mt. Prospect; Weizhi Chen, Northfield; Ahmad Akashe, Mundelein, and Miranda Miller, Arlington Heights, all of Ill., assignors to Kraft Foods Holdings, Inc., Northfield, Ill.

Division of application No. 09/679,483, filed on Oct. 4, 2000. This application Feb. 9, 2001, Appl. No. 781,907.

Int. Cl. A21D *10/00*

U.S. Cl. 426—549 **7 Claims**

1. A method for making a microwaveable cake which can be heated in a microwave oven, said method comprising:

(a) forming a dry mixture containing about 10 to about 30 percent maltodextrin; about 10 to about 30 percent cake flour; about 1.0 to about 5.0 percent starch; about 5 to about 20 percent sugar; about 0.5 to about 2.0 percent salt;

(b) forming a mesophase-maltodextrin mixture by adding about 1 to about 3 percent maltodextrin to a mesophase get;

(c) forming a mesophase-sugar mixture by mixing about 5 to about 15 percent mesophase-maltodextrin mixture; about 5 to about 20 percent sugar; about 25 to about 45 percent water; and about 0 to about 1.0 percent vanilla flavoring together;

(d) adding the mesophase-sugar mixture to the dry mixture to form a sponge cake batter; and

(e) pouring the sponge cake batter into cake pans; wherein the microwaveable cake batter, when heated using a microwave oven, rises and forms a palatable cake;

wherein the mesophase gel comprises either

(1) a high HLB emulsifier which has an HLB of between about 11 and about 25 and a medium HLB emulsifier which has an HLB of between about 6 and 10; or

(2) a high HLB emulsifier which has an HLB of between about 11 and about 25, a medium HLB emulsifier which has an HLB of between about 6 and about 10, and a low HLB emulsifier which has an HLB of between about 2 and about 6.

US 6,410,075 B1

STARCH PRODUCTS HAVING HOT OR COLD WATER DISPERSIBILITY AND HOT OR COLD SWELLING VISCOSITY

Wayne Dudacek, LaGrange; Joyce A. Engels, Lemont; J. E. Todd Giesfeldt, La Grange, and Gregory Vital, Sauk Village, all of Ill., assignors to Corn Products International, Inc., Bedford Park, Ill.

Division of application No. 08/542,610, filed on Oct. 13, 1995, now Pat. No. 6,001,408. This application Apr. 15, 1998, Appl. No. 60,730.

Int. Cl. A23L *1/05;* **C08B** *30/12*

U.S. Cl. 426—578 **9 Claims**

1. A dry mix composition consisting essentially of the ingredients of a sauce, gravy, salad dressing, pudding mix, soup, dough conditioner or beverage and a heterogeneous mixture of physically modified starch particles wherein a majority of said starch particles are partially to fully gelatinized said heterogeneous mixture having a hydration capacity greater than about 5 and percent solubles less than about 2.

US 6,410,076 B1

METHOD AND APPARATUS FOR PRODUCING PACKED FRESH CURD BLOCKS

Wieger Van Der Meulen, Damwoude, Netherlands, assignor to Tetra Laval Holdings & Finance S.A., Den Haag, Netherlands

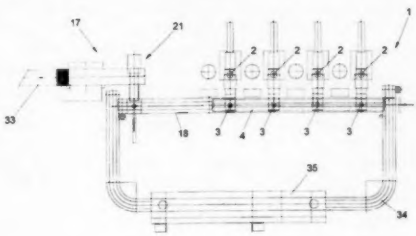
Filed Nov. 18, 1998, Appl. No. 195,064

Claims priority, application Netherlands, Nov. 18, 1997, 1007571

This patent is subject to a terminal disclaimer.

Int. Cl. A23C *19/00*

U.S. Cl. 426—582 **34 Claims**



1. A method for producing packed fresh curd blocks, comprising:

forming a plurality of curd blocks using a plurality of curd block former columns into which curd chips are fed and consolidated;

independently moving said formed curd blocks to and into respective conveyor holders; and

after all of the plurality of formed curd blocks are placed in their respective conveyor holders, conveying each of said conveying holders from its associated curd block former column sequentially to a central automatic packaging apparatus wherein the curd blocks are removed from their respective conveying holders and subsequently packaged.

US 6,410,077 B1

COMBINED MILK, JUICE, AND CEREAL GRAIN/ POLYSACCHARIDE BLEND FOR CONSUMPTION AND METHOD FOR PRODUCTION THEREOF

Joel I. Dulebohn, Lansing; Ronald J. Carlotti, Grand Rapids, and James A. Richter, Dexter, all of Mich., assignors to Michigan Biotechnology Institute, Lansing, Mich.

Provisional application No. 60/119,919, filed on Feb. 12, 1999, Provisional application No. 60/124,853, filed on Mar. 17, 1999. This application Feb. 11, 2000, Appl. No. 502,475.

Int. Cl. A23L *2/02; 1/10;* **A23C** *9/00*

U.S. Cl. 426—599 **20 Claims**

1. A mixture comprising a milk component; a juice component, a polysaccharide or cereal component selected from the group consisting of polysaccharides, cereals, and combinations of polysaccharides and cereals; and a composition comprising an amino acid, an organic or inorganic acid, and a metal ion, wherein the mixture is a stable mixture.

US 6,410,078 B1

TRIGLYCERIDES, RICH IN POLYUNSATURATED FATTY ACIDS

Frederick William Cain, Voorburg, Netherlands; Gerald Patrick McNeill, Rushden, and Stephen Raymond Moore, Thrapston, both of United Kingdom, assignors to Loders-Croklaan B.V., Wormerveer, Netherlands

Continuation of application No. 08/638,742, filed on Apr. 29, 1996, now abandoned. This application Dec. 3, 2001, Appl. No. 998,179.

Claims priority, application European Pat. Off., Apr. 28, 1995, 95302942

Int. Cl. A23D *9/00*

U.S. Cl. 426—606 **10 Claims**

1. An interesterified triglyceride-composition, comprising at least two different long chain poly-unsaturated fatty acids L_1 and L_2, both of said different poly-unsaturated fatty acids having at least 3 unsaturations and having at least 20 carbon atoms from which L_1 is the most abundant and L_2 is the second most abundant, wherein the triglyceride composition contains at Least 30 wt % of L_1 the weight ratio L_1:L_2 is at least 3, and the triglyceride composition also contains an oxidative stabilizing amount of at least 2 wt % of saturated fatty acid with 2–12 or 20–24 carbon atoms or a combination of saturated fatty acids with 2–12 and 20–24 atoms, wherein the triglyceride composition does not contain more than 10 wt % of saturated fatty acids with 16–18 carbon atoms, and at least 5 wt % of the saturated C_2–C_{12} or C_{20}–C_{24} fatty acid residues is bonded on a triglyceride molecule, wherein at least L_1 and/or L_2 is present, said composition being characterized by its reduced or lack of odor or fish swell and off-taste.

US 6,410,079 B2

HIGH MEAT PET FOOD COMPOSITIONS

Wai Lun Cheuk; Larry Harland Hayward, and Peter Laisui Thawnghmung, all of Topeka, Kans., assignors to Hill's Pet Nutrition, Inc., Topeka, Kans.

Filed Dec. 28, 1999, Appl. No. 473,106

Int. Cl. A23L *1/314*

U.S. Cl. 426—641 **14 Claims**

1. A dry pet diet composition comprising

a. above 50 to about 65 wt. % meat, and

b. cellulosic material in quantities effective to allow extrusion and cutting of the composition post extender, said material being about 6 to about 20 wt. % of the composition.

US 6,410,080 B1

METHOD FOR FORMING A LIQUID FILM ON A SUBSTRATE

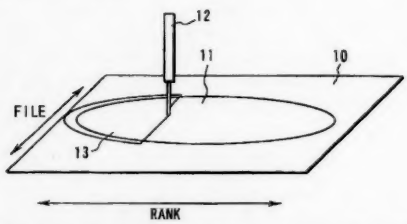
Shinichi Ito, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 26, 2000, Appl. No. 669,725

Claims priority, application Japan, Sep. 27, 1999, 11-272327; Aug. 25, 2000, 2000-255461

Int. Cl. B05D *1/02*

U.S. Cl. 427—8 **5 Claims**



1. A liquid film forming method of dropping a liquid from a dropping nozzle or dropping nozzles of a dropping unit onto a substrate to be processed, and then providing relative movement between the dropping unit and the substrate while keeping the liquid dropping on the substrate, so as to form a liquid film on the substrate,

wherein the relative movement between the dropping unit and the substrate is composed of straight movement along a file direction in which the dropping unit passes from one end side of the substrate over the substrate to the other end side of the substrate, and movement along a rank direction perpendicular to the file direction outside the substrate at a pitch p,

the movement along the file direction contains movement of a constant speed of v in a section where the dropping nozzle passes over the substrate, and movement of an acceleration of a or −a in the section where the dropping nozzle passes over an outside area of the substrate;

wherein a dropping amount W of the liquid dropped from the nozzle, where W is measured in volume/time, is proportional to the movement of a constant speed v; and

wherein the movement of constant speed v along the file direction is represented by the formula

$$v=((L)(a)/2)^{1/2}$$

where (L) is a length of the section in the file direction of the substrate over which the nozzle passes at the constant speed, and (a) is the absolute value of acceleration.

US 6,410,081 B1

PASTE FOR WELDING CERAMICS TO METALS AND METHOD FOR PRODUCING A WELDED JOINT

Claudio De La Prieta, Stuttgart; Uwe Glanz, Asperg; Carmen Schmiedel, Marbach am Neckar; Petra Kitiratschky, Renningen, and Bernhard Zappel, Unterensingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE99/02421, § 371 Date Nov. 17, 2000, § 102(e) Date Nov. 17, 2000, PCT Pub. No. WO00/15384, PCT Pub. Date Mar. 23, 2000

PCT Filed Aug. 4, 1999, Appl. No. 554,404

Claims priority, application Germany, Sep. 16, 1998, 198 42276

Int. Cl. B05D *5/12;* **B23K** *31/02*

U.S. Cl. 427—96 **22 Claims**

1. A paste for welding ceramic materials to metallic contact surfaces or metals, comprising a paste including at least one noble metal, at least one aluminum compound, at least one silicon compound, and at least one compound selected from the group consisting of barium compounds, calcium compounds, and magnesium compounds, wherein the paste contains 5 to 60 wt % of an aluminum compound, 0.2 to 5 wt % of a silicon compound, 0.2 to 5 wt % of a compound selected from the group consisting of barium compounds, calcium compounds, and magnesium compounds, and 20 to 80 wt % noble metal.

US 6,410,082 B1

PROCESS FOR THE FORMATION OF A HEAT-TRANSFERABLE SECURITY STAMP ENTIRELY FREE OF NON-AQUEOUS SOLVENTS

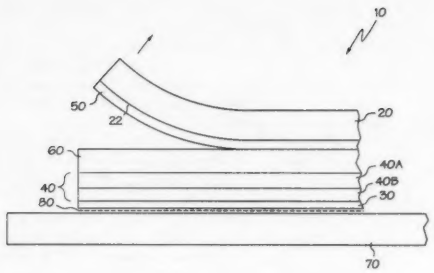
William F. Pinell, Lebanon; Rajendra Mehta, Centerville; Harry A. Seifert, Kettering, all of Ohio, and John M. Harden, Oxford, N.C., assignors to The Standard Register Company, Dayton, Ohio

Continuation-in-part of application No. 09/374,923, filed on Aug. 16, 1999, now abandoned. This application Jan. 13, 2000, Appl. No. 482,672.

Int. Cl. B41M *3/12;3/14;* **B44C** *1/17;1/24;* **B32B** *7/00*

U.S. Cl. 427—146 **31 Claims**

1. A process for forming a unitary heat-transferable security



stamp comprising a carrier sheet, a top coat layer, at least one design layer between said carrier sheet and said top coat layer, a release layer between said carrier sheet and said design layer, and a base coat layer between said release layer and said design layer, wherein said process comprises the steps of:

providing said carrier sheet;

forming said release layer by presenting a water-borne adhesive release component;

forming said base coat layer by presenting a water-borne base coat component;

forming said design layer by presenting a water-borne design component; and

forming said top coat layer by presenting a water-borne top coat component, wherein

said carrier sheet is selected such that it is resistant to heat above a predetermined heat transfer temperature,

said adhesive release component of said release layer is selected such that it is operative to secure said carrier sheet to said base coat layer at temperatures below said heat transfer temperature and to permit release of said carrier sheet from said base coat layer at temperatures above said heat transfer temperature,

said base coat component of said base coat layer is selected such that it is operative to function as a barrier between said release layer and said design layer at temperatures above and below said heat transfer temperature,

said design component of said design layer is selected such that it is operative to provide an indication of the presence of said security stamp,

said top coat component is selected such that it is operative to adhere to a substrate upon contact with said substrate and upon application of heat at said heat transfer temperature, and

said release layer, said base coat layer, said design layer, and said top coat layer are further formed by at least one drying step characterized by microwave irradiation.

US 6,410,083 B1

METHOD FOR DOPING SINTERED TANTALUM AND NIOBIUM PELLETS WITH NITROGEN

Yuri L. Pozdeev-Freeman, Kennebunk, Me., assignor to Vishay Sprague, Inc., Sanford, Me.

Division of application No. 09/146,685, filed on Sep. 3, 1998, now Pat. No. 6,185,090, which is a continuation-in-part of application No. 08/790,293, filed on Jan. 29, 1997, now Pat. No. 5,825,611. This application Feb. 25, 2000, Appl. No. 514,221.

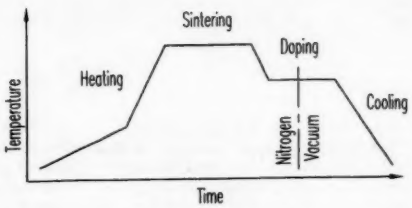
This patent is subject to a terminal disclaimer.

Int. Cl. B05D *7/00*

U.S. Cl. 427—216 **14 Claims**

1. A method for making a nitrogen-doped tantalum and/or niobium pellet comprising:

contacting a pellet, said pellet having an inner portion and an outer layer and a temperature of between about 600° C. and about 1400° C. with nitrogen in an oxygen-free environment for an amount of time sufficient such that the nitrogen diffuses from the outer layer into the inner portion of the pellet;



wherein the pellet is comprised of particles selected from the group consisting of tantalum and niobium.

US 6,410,084 B1

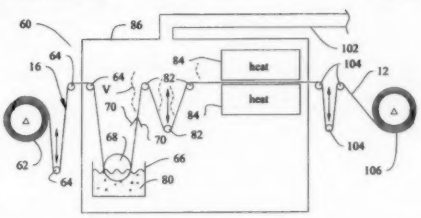
POROUS MEMBRANE STRUCTURE AND METHOD

Robert John Klare, Oxford, Pa., and David Elliot Chubin, Overland Park, Kans., assignors to BHA Technologies, Inc., Kansas City, Mo.

Division of application No. 09/249,519, filed on Feb. 12, 1999, now Pat. No. 6,228,477. This application Dec. 10, 1999, Appl. No. 458,301.

Int. Cl. B05D *3/02*

U.S. Cl. 427—244 **16 Claims**



1. A method of treating a membrane, said method comprising the steps of:

providing a membrane with surfaces that define a plurality of pores extending through the membrane;

providing a water-based dispersion having solids of an oleophobic fluoropolymer;

diluting the dispersion of the oleophobic fluoropolymer with a water-miscible liquid wetting agent;

wetting surfaces which define the pores in the membrane with the diluted dispersion of the oleophobic fluoropolymer;

removing the wetting agent and other fugitive materials from the membrane; and

coalescing the solids in the dispersion of the oleophobic fluoropolymer on surfaces that define the pores in the membrane.

US 6,410,085 B1

METHOD OF MACHINING OF POLYCRYSTALLINE DIAMOND

Nigel Dennis Griffin, Nympsfield, and Peter Raymond Hughes, Stroud, both of United Kingdom, assignors to Camco International (UK) Limited, United Kingdom

Provisional application No. 60/234,075, filed on Sep. 20, 2000, Provisional application No. 60/281,054, filed on Apr. 2, 2001. This application Aug. 31, 2001, Appl. No. 682,425.

Int. Cl. C23C *16/26*

U.S. Cl. 427—247.7 **9 Claims**

1. A method for machining a polycrystalline diamond component, the polycrystalline diamond component including a matrix of interstices and wherein a first volume of the component adjacent to a working surface thereof is substantially free of catalyzing material, and a second volume of the component remote from the working surface contains the catalyzing material, comprising the steps of rendering the volume which is substantially free of cata-

lyzing material electrically conductive, and using an electron discharge machining technique to machine the polycrystalline diamond.

US 6,410,086 B1

METHOD FOR FORMING HIGH PERFORMANCE SURFACE COATINGS AND COMPOSITIONS OF SAME

David G. Brandon; Ludmilla Cherniak, both of Haifa; Albir A. Layyous, Upper Galilee; Alex Barsky, Maalot; Ron Goldner, Mizpe Adi; Leah Gal-Or, Haifa; Ronen Lanir, Yokeneam, and Shay Gilboa, Haifa, all of Israel, assignors to Cerel (Ceramic Technologies) Ltd., Tirat Ha Carmel, and Iscar Ltd., Tefen, both of Israel

Filed Nov. 26, 1999, Appl. No. 449,958

This patent is subject to a terminal disclaimer.

Int. Cl. C23C *16/00;* **C25C** *1/12*

U.S. Cl. 427—248.1 **20 Claims**

1. A method for forming on an object a high performance surface coating having high mechanical strength exhibiting hardness and wear resistance, and, high thermal and chemical durabilities, the method comprising the steps of:

(a) electrophoretically depositing at least one surface coating material on a surface of the object for obtaining a green coating on said surface of the object; and

(b) infiltrating into and depositing onto said green coating at least one additional surface coating material by a gas-phase infiltration/deposition method, thereby forming the high performance surface coating;

wherein, at least one of said at least one surface coating material and said at least one additional surface coating material is chemically and physically stable above 700° C.

US 6,410,087 B1

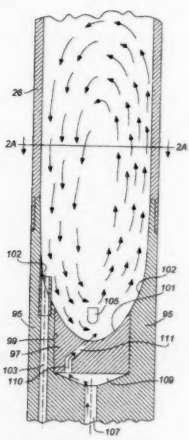
DEPOSITION OF PYROCARBON

David S. Wilde, Round Rock; Michael R. Emken, Pflugerville, and James A. Accuntius, Georgetown, all of Tex., assignors to Medical Carbon Research Institute, LLC, Austin, Tex.

Filed Nov. 1, 1999, Appl. No. 431,520

Int. Cl. C23C *16/00;16/26;16/32*

U.S. Cl. 427—249.1 **12 Claims**



9. A process for depositing pyrolytic carbon from a gaseous atmosphere in a defined region which is generally circular in horizontal cross-section and has a bottom surface and a generally vertical lateral boundary, which process comprises

injecting a gaseous atmosphere, which includes an inert carrier gas and a carbonaceous substance, into said defined region through said bottom surface which has three-dimensional, generally hemispheroidal or ovoid concave shape so as to levitate small spheroids and components of a size greater than said spheroids, and to create an ascending fluidized bed including said components within one boundary portion of said defined region and a descending fluidized bed within an opposite boundary portion thereof, and

heating said defined region and said levitated substrates to a temperature such that said carbonaceous substance pyrolytically decomposes to deposit pyrolytic carbon upon the surfaces of said spheroids and components,

whereby highly uniform crystalline pyrolytic carbon is deposited upon said spheroids and components as a result of minimizing temperature and gas concentration gradients which results in uniform decomposition of said carbonaceous substance throughout said fluidized bed.

US 6,410,088 B1

CVI (CHEMICAL VAPOR INFILTRATION) DENSIFICATION OF POROUS STRUCTURES

Christian Robin-Brosse, Le Haillan; Jacques Thebault, Bordeaux; Yves Patrigeon, Bordeaux Cauderan; Gilles Bondieu, Saint Jean D'Illac, and Jean-Luc Domblides, Bruges, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.M.A., Paris, France

Filed Oct. 19, 1999, Appl. No. 420,428

Claims priority, application France, Oct. 20, 1998, 98 13114

Int. Cl. C23C *16/26*

U.S. Cl. 427—249.2 **23 Claims**

1. A method of densifying porous structures by chemical vapor infiltration, wherein said porous structures are surrounded by a vapor containing toluene as a precursor for carbon, said toluene optionally mixed with at least one other precursor for carbon.

US 6,410,089 B1

CHEMICAL VAPOR DEPOSITION OF COPPER USING PROFILED DISTRIBUTION OF SHOWERHEAD APERTURES

Xin Sheng Guo, Los Altos Hills; Keith Koai, Los Gatos; Ling Chen, Sunnyvale; Mohan K. Bhan, Cupertino, and Bo Zheng, San Jose, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of application No. 09/023,437, filed on Feb. 13, 1998, now Pat. No. 6,050,506. This application Feb. 24, 2000, Appl. No. 513,723.

Int. Cl. C23C *16/80*

U.S. Cl. 427—250 **21 Claims**

1. A copper CVD process, comprising supplying a precursor gas capable of depositing copper in a thermal process through a line to a port communicating with a gas cavity formed at the back of a perforated faceplate including a number of holes therethrough, a substantially circularly symmetric distribution of said holes about a central axis of said perforated faceplate varying by at least 10%.

US 6,410,090 B1

METHOD AND APPARATUS FOR FORMING INSITU BORON DOPED POLYCRYSTALLINE AND AMORPHOUS SILICON FILMS

Shulin Wang, Campbell, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed Sep. 29, 1998, Appl. No. 163,594

Int. Cl. C23C *16/24*

U.S. Cl. 427—255.38 **20 Claims**

1. A method for forming a boron doped amorphous silicon film or a boron adoped polycrystalline silicon film comprising:

generating a deposition pressure within a chamber of between 10–50 torr;

heating a substrate in said deposition chamber to a temperature greater than or equal to 580° C.;

providing a reactant gas mix into said deposition chamber, said reactant gas mix comprising a silicon source gas, a boron source, and a carrier gas while heating said substrate; and

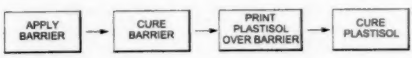
wherein the residence time of said reactant gas mix in said deposition chamber is less than or equal to 3.0 seconds.

US 6,410,091 B1

PLASTISOL-PRINTED DYED POLYESTER FABRICS AND METHOD OF PRODUCING SAME

Kantilal A. Jasani, Pine Grove, Pa., and Phillip D. McCartney, Greensboro, N.C., assignors to Guilford Mills, Inc., Greensboro, N.C.

Filed Apr. 26, 1999, Appl. No. 299,802
Int. Cl. B05D *1/38*
U.S. Cl. 427—258 **20 Claims**



1. A method of printing a dyed polyester fabric with a plastisol printing composition substantially without the printing composition dissolving the dye of the fabric, the method comprising:

(a) providing a web of textile fabric to be printed, the fabric containing dyed polyester fibers as a proportion of the content of the fabric;

(b) selecting a surface area of the fabric to be treated with a plastisol printing composition;

(c) applying to at least the selected area of the fabric a blocking composition to form a printing receptor barrier over the selected area; and

(d) imprinting the plastisol printing composition in a desired image or pattern onto the barrier in the selected area of the fabric;

wherein the barrier substantially separates the fabric and the plastisol printing composition from one another to prevent chemical interaction between the solvent in the printing composition and the dye in the polyester fibers of the fabric and thereby to prevent undesired discoloration of the printing composition.

US 6,410,092 B1

AUTODEPOSITION POST-BATH RINSE PROCESS

Zhiqi Yang, Troy, and William E. Fristad, Rochester Hills, both of Mich., assignors to Henkel Corporation, Gulph Mills, Pa.

Provisional application No. 60/135,304, filed on May 21, 1999. This application Apr. 25, 2000, Appl. No. 557,534.
Int. Cl. B05D *3/10;3/02*
U.S. Cl. 427—340 **8 Claims**

1. A method of improving the corrosion resistance of a metallic surface, said method comprising

a) contacting said metallic surface with an autodeposition bath comprising a resin in uncured emulsion or dispersion form and an autodeposition activator until a layer of the resin of desired thickness is autodeposited on said metallic surface;

b) rinsing said metallic surface having the layer of resin autodeposited thereon with a chromium-free aqueous solution comprising an anticorrosive effective amount of at least one water-soluble alkaline earth metal compound selected from the group consisting of calcium nitrate, calcium chloride, calcium acetate, calcium formate, barium nitrate, barium acetate, and magnesium benzoate; and

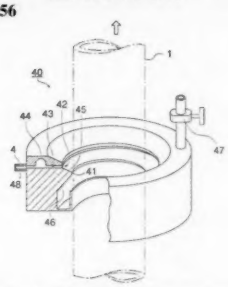
c) curing the layer of resin autodeposited on said metallic surface, wherein said layer of resin autodeposited on said metallic surface is not contacted with any chromium compound and is not rinsed with water alone after the rinsing step b) and before said curing.

US 6,410,093 B2

COATING METHOD FOR CYLINDRICAL BASE MEMBER

Akira Ohira; Junji Ujihara; Nobuaki Kobayashi, and Masao Asano, all of Hachioji, Japan, assignors to Konica Corporation, Japan

Filed Dec. 31, 1998, Appl. No. 224,584
Claims priority, application Japan, Jan. 9, 1998, 10-002874
Int. Cl. B05D *3/12*
U.S. Cl. 427—356 **4 Claims**



1. A coating method of coating an outer circumferential surface of a cylindrical base with a coater having a supply port, a ring-shaped coating solution chamber, and a slit having a circular flow-out port, said slit connecting the circular flow-port with the coating solution chamber, the slit having a gap and the circular flow-out port being provided around an inner circumferential surface of the coater, comprising steps of

feeding a coating solution from the supply port to the coating solution chamber so that the coating solution is discharged to the slit;

adjusting an absolute pressure P in the coating solution chamber by varying the gap of the slit, a viscosity of the coating solution and a flow quantity of the coating solution so as to satisfy the following formula:

$$3\times10^{4} \leqq P \leqq 3\times10^{5}\ (mmH_2O)$$

and

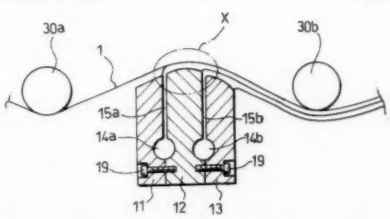
relatively moving the cylindrical base through a hole formed by the inner circumferential surface of the coater so that an outer circumferential surface of the cylindrical base is uniformly coated with the coating solution flowing out from the slit.

US 6,410,094 B2

EXTRUSION COATING HEAD AND COATING METHOD FOR FLEXIBLE SUPPORT

Toshihiro Mandai, and Norio Shibata, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 17, 1999, Appl. No. 251,400
Claims priority, application Japan, Feb. 19, 1998, 10-037600
Int. Cl. B05D *3/12;* **B05C** *3/12*
U.S. Cl. 427—356 **16 Claims**



1. An extrusion coating method comprising the steps of:

providing an extrusion coating head extending in a width direction perpendicular to a conveying direction of a continuously conveying flexible support and including an upstream side

block and a downstream side block aligned in the conveying direction, in which the upstream side block and the downstream side block respectively have edge surfaces on which the flexible support is pressed and the upstream and downstream side blocks define therebetween a slit through which a coating composition is extruding and applied onto the flexible support;

providing a pair of tension rollers for pressing the flexible support toward the upstream side block and the downstream side block such as to generate a pressure p2 on a doctor edge surface based on the pressing of the flexible support; and

adjusting, independently and at discrete locations along the width direction, a length (t) of a perpendicular line which is drawn from an upstream end (A) of the edge surface of the downstream side block to a tangential line (L) of the edge surface of the downstream side block which is drawn from a downstream end of the edge surface of the upstream side block, so that when the length (t) is adjusted the sum P of a pressure loss p1 during passage of the coating composition through the slit and the pressure p2 becomes uniform in the width direction of the support, to partially adjust a coating thickness to obtain a uniform thickness distribution while applying the coating composition on the flexible support in the width direction.

US 6,410,095 B1

SOLVENT-FREE BINDER COMPOSITIONS AND THEIR USE IN ONE- AND TWO-COMPONENT COATING COMPOSITIONS

Martin Brahm, Leverkusen; Gerhard Ruttmann, Burscheid, and Lutz Schmalstieg, Köln, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 6, 1996, Appl. No. 706,551

Claims priority, application Germany, Sep. 15, 1995, 195 34 162

Int. Cl. C09D *175/04;175/02;* **C08G** *18/78;18/77*

U.S. Cl. 427—385.5 **11 Claims**

1. A method for making a blister-free coating comprising:

(1) applying a substantially solvent-free binder composition to a substrate, the solvent-free binder composition comprising:

a) a polyisocyanate component containing heteroallophanate groups and having aromatically-bound isocyanate groups,

i) an NCO content of 3 to 16% by weight based on the weight of the polyisocyanate component,

ii) an average functionality of 1.8 to 4,

iii) an allophanate group content (calculated as $C_2HN_2O_3$, MW: 101) of 5 to 35% by weight, based on the weight of the polyisocyanate component, wherein the allophanate groups are prepared from urethane groups that are the reaction product of a linear aliphatic diisocyanate having an isocyanate group content of 30 to 60% by weight, based on the weight of the linear aliphatic diisocyanate, with a hydroxyl component having a hydrocarbon chain of 2 to 23 carbon atoms and an average functionality of less than 1.5 at an NCO/OH equivalent ratio of 1.0:1.0 to 0.5:1.0,

iv) a hydrocarbon chain content of 10 to 65% by weight, based on the weight of the polyisocyanate component, wherein the hydrocarbon chains are attached to allophanate groups via oxygen and have an average of 2 to 23 carbon atoms and

v) a distillable diisocyanate content of less than 0.5% by weight, based on the weight of the polyisocyanate component, and

b) an isocyanate-reactive component; and

(2) curing the composition.

US 6,410,096 B1

METHOD FOR PRODUCING A BIOLOGICALLY DEGRADABLE POLYHYDROXYALKANOATE COATING WITH THE AID OF AN AQUEOUS DISPERSION OF POLYHYDROXYALKANOATE

Gerrit Eggink, Ede, and Martin Dinant Northolt, Suawoude, both of Netherlands, assignors to Stichting Onderzoek en Ontwikkeling Noord-Nederland (SOONN), Leeuwarden, Netherlands

Division of application No. 08/765,147, filed on Jan. 23, 1997, now Pat. No. 5,958,480. This application Jul. 6, 1999, Appl. No. 347,417.

Claims priority, application Netherlands, Jun. 23, 1994, 9401037

Int. Cl. B32B *27/00;* **C08G** *63/00;63/66;* **B05D** *5/00*

U.S. Cl. 427—385.5 **4 Claims**

1. Method for producing a biologically degradable polyhydroxyalkanoate coating on a product in the form of an elastomeric film, wherein an aqueous dispersion of poly-hydroxyalkanoate or a mixture of polyhydroxyalkanoates is prepared and the dispersion is applied to the surface to be coated, after which water is made or allowed to evaporate to obtain a polyhydroxyalkanoate film, wherein the film formation takes place at a temperature lower than the melting point of the polyhydroxyalkanoate and wherein the polyhydroxyalkanoate used is a polymer which occurs in Pseudomonas, said method of producing an elastomeric film being carried out in absence of further steps of hot fusion, hot pressing or contact with chloroform or halogenated solvents to obtain the elastomeric characteristic with the proviso the polyhydroxyalkanoate is not a polymer or copolymer of β-hydroxybutyrate or β-hydroxy-valerate.

US 6,410,097 B2

PROCESS FOR PRODUCING PRINTING SHEET

Katsuya Kume, and Katsuyuki Okazaki, both of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Jan. 10, 2001, Appl. No. 756,790

Claims priority, application Japan, Jan. 17, 2000, 2000-007954

Int. Cl. B05D *3/02*

U.S. Cl. 427—387 **2 Claims**

1. A process for producing a printing sheet which comprises spreading a coating liquid containing at least a cellulosic polymer and a silicone resin as components on a carrier film wherein at least a surface layer on the side to be coated with the coating liquid comprises poly(vinylidene fluoride), and drying the coating to form an ink-receiving layer.

US 6,410,098 B1

PROCESS FOR PREPARING COPPER-FILM-PLATED STEEL CORD FOR VEHICLE TIRE

Gon Seo; Pyong Lee Cho; Gyung Soo Jeon, all of Chonnam, and Seung Kyun Ryu, Seoul, all of Rep. of Korea, assignors to Digital Plating Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 5, 2000, Appl. No. 610,183

Int. Cl. B05D *1/38;3/12;* **B21C** *1/02*

U.S. Cl. 427—405 **5 Claims**

1. A process for preparing a copper-film-plated steel filment comprising plating ti on the surface of a steel filarnent, draang the tin-plated steel filament, and contacting the drawn tin-plated filament with a solution of cuprin sulfate, cupric nitrate, cupric chloride, or cupric acetate to plate a copper film on the surface of the tin-plated steel filament to form a copper-film plated steel filament having an outer layer of copper film.

US 6,410,099 B1

READILY REPLACEABLE IMAGE GRAPHIC WEB

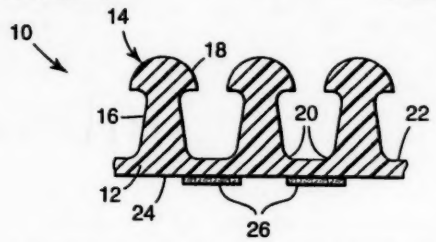
Francis V. Loncar, Jr., St. Joseph Township, St. Croix County, Wis., assignor to 3M Innovative Properties Company, St. Paul, Minn.

PCT No. PCT/US97/03490, § 371 Date Oct. 3, 1997, § 102(e) Date Oct. 3, 1997, PCT Pub. No. WO98/39759, PCT Pub. Date Sep. 11, 1998

PCT Filed May 3, 1997, Appl. No. 930,957

Int. Cl. B05D *1/04*

U.S. Cl. 427—466 11 Claims



1. A method of providing a readily replaceable image graphic, comprising:

a) providing an imageable sheet comprising

(i) a major surface comprising an imageable continuous surface, and

(ii) an opposing major surface comprising a nonadhesive substrate mating surface comprising at least one mechanical fastener element integrally formed from said opposing major surface; and

b) imaging directly onto said imageable continuous surface using an imaging process.

US 6,410,100 B1

METHOD OF APPLYING A COATING MEDIUM ON A TRAVELING FIBER MATERIAL WEB

Richard Bernert, Giengen; Rüdiger Kurtz, Heidenheim; Martin Kustermann, Heidenheim; Bernhard Kohl, Heidenheim; Hans-Dieter Dörflinger, Heidenheim, and Benjamin Mendez-Gallon, Itzelberg, all of Germany, assignors to Voith Sulzer Papiermaschinen GmbH, Heidenheim, Germany

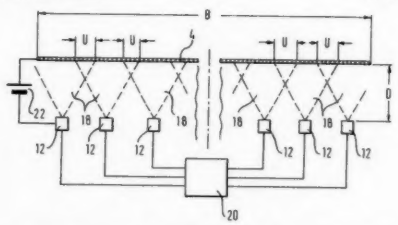
Continuation of application No. 09/084,727, filed on May 26, 1998, now Pat. No. 6,063,450. This application May 15, 2000, Appl. No. 570,822.

Claims priority, application Germany, May 27, 1997, 197 22 159

This patent is subject to a terminal disclaimer.

Int. Cl. B05D *1/04;3/12*

U.S. Cl. 427—475 18 Claims



1. A method of directly or indirectly applying a liquid or pasty application medium to one or both sides of a continuous surface of a traveling fiber material web, said fiber material web being one of a paper web and a cardboard web, said fiber material web being adjacent a backing roll during said applying, wherein

said application medium comprises a coating medium and is applied to said surface in a plurality of single application regions by means of a plurality of single application nozzles spaced apart from one another side by side and/or in succession in the direction of width of said surface and distanced from said surface, said application medium emerging from each of said nozzles as a spray in a form of a fanshape, each of said nozzles being one of a nozzle jet, a spray jet and a free jet, said nozzles conjunctively jetting a continuous curtain over the entire width of said continuous surface,

said continuous surface entraining an air boundary layer, said air boundary layer being removed ahead of said single application nozzles relative to a direction of travel of said fiber material web,

wherein adjacent single application regions respectively intersect in their respective edge regions at least in part, causing a layer of application medium to be produced over substantially the entire width of said surface to be coated.

US 6,410,101 B1

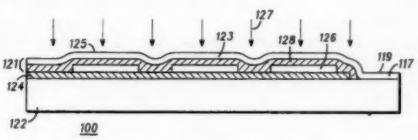
METHOD FOR SCRUBBING AND PASSIVATING A SURFACE OF A FIELD EMISSION DISPLAY

James E. Jaskie, and Albert Alec Talin, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 16, 2000, Appl. No. 505,124

Int. Cl. C23C *14/06;14/34;* H05H *1/24;* B05D *5/12*

U.S. Cl. 427—524 6 Claims



1. A method for scrubbing and passivating an anode plate of a field emission display comprising the steps of: providing the anode plate comprising a transparent, conductive material;

providing a scrubbing passivation material which is a carbon;

imparting to the scrubbing passivation material an energy selected to cause removal of a contamination layer from the anode plate; comprising

the step of imparting to the carbon the energy within a range of 400–500 electronvolts;

causing the scrubbing passivation material to be received by the contamination layer, thereby removing the contamination layer; and

depositing at least a portion of the scrubbing passivation material on the anode plate, thereby forming a passivation layer.

US 6,410,102 B1

PLASMA PROCESS METHOD

Junichiro Hashizume; Shigenori Ueda, both of Nara, and Makoto Aoki, Joyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

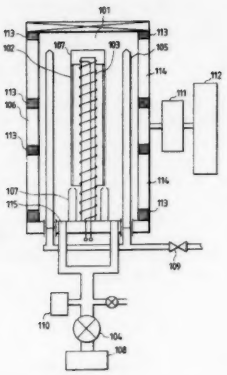
Filed Jun. 13, 1997, Appl. No. 874,584

Claims priority, application Japan, Jun. 17, 1996, 8-177126

Int. Cl. C23C *14/56*

U.S. Cl. 427—534 4 Claims

1. A plasma process method comprising introducing a raw-material gas into a deposition chamber while evacuating the inside of the deposition chamber capable of being kept airtight in a vacuum while evacuating the inside of the deposition chamber, performing decomposition of the raw-material gas by high-frequency power in a VHF band, performing film formation of a deposit film on a substrate installed in the deposition chamber, and thereafter cleaning the inside of the deposition chamber, wherein said film formation is carried out by evacuating the inside of the deposition chamber by use of a diffusion pump or turbo molecular pump, introducing a raw-material gas containing silicon atoms into the deposition chamber, decomposing the raw-material gas using



the high-frequency power in the range of 50 MHz to 450 MHz inclusive, and wherein said cleaning is carried out by evacuating the inside of the deposition chamber without use of a diffusion pump or turbo molecular pump, introducing into the deposition chamber at least one gas containing fluorine atoms selected from the group consisting of CF_4, CF_mH_n (m+n=4), ClF_3, and C_2F_6, and decomposing the at least one gas containing fluorine atoms using a high-frequency power of a frequency of 1 MHz to 20 MHz inclusive, thereby etching and removing a deposit film adhering to the inside of the deposition chamber.

US 6,410,103 B1

MEMORY DISC, MANUFACTURING METHOD THEREOF, AND METHOD OF MANUFACTURING DISC DRIVE UTILIZING SUCH MEMORY DISC

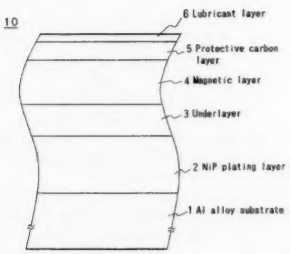
Yoshiharu Kasamatsu; Takashi Toyoguchi, and Takayuki Yamamoto, all of Kanagawa, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 24, 1999, Appl. No. 256,887

Claims priority, application Japan, Jul. 24, 1998, 10-209734

Int. Cl. G11B *5/725*

U.S. Cl. 427—553 **2 Claims**



1. A method of manufacturing a magnetic memory disk, comprising the steps of:

forming a carbon protective layer on a disk substrate having an average roughness Ra of 1.0 nm or less;

forming a lubricant layer whose thickness is 1.5 nm or more by coating a lubricant on said carbon protective layer;

irradiating said lubricant layer with ultra-violet light; and

removing a free layer of said lubricant layer by a solvent, whereby said lubricant layer consists of a bonding layer of lubricant, said bonding layer being a non-fluid layer.

US 6,410,104 B1

ELECTROLESS NICKEL-PHOSPHOROUS COATINGS WITH HIGH THERMAL STABILITY

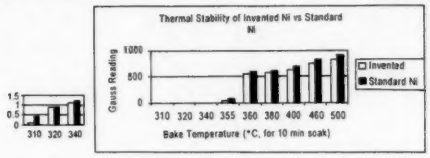
Linda L. Zhong, Fremont; Connie C. Liu, San Jose, and Jeff D. St. John, Los Gatos, all of Calif., assignors to Seagate Technology LLC, Scotts Valley, Calif.

Continuation-in-part of application No. 09/122,761, filed on Jul. 27, 1998, now Pat. No. 6,106,927, Provisional application No. 60/129,308, filed on Apr. 14, 1999. This application Jan. 24, 2000, Appl. No. 489,935.

This patent is subject to a terminal disclaimer.

Int. Cl. B05D *5/12;3/06;3/10;1/18;1/36*

U.S. Cl. 427—554 **12 Claims**



1. A method of manufacturing a magnetic recording medium, the method comprising:

electrolessly depositing an amorphous nickel-phosphorous (Ni—P) coating on a non-magnetic substrate employing a plating bath containing aluminum (Al) and/or copper (Cu) ions in an effective amount to achieve an as-deposited average surface roughness (Ra) less than about 10 Å and a magnetic formation temperature not less than about 320° C.; and

cleaning the Ni—P coating with an acidic agent having a pH less than about 4 or an alkaline agent having a pH greater than about 12 without any substantial depletion of nickel from the surface of the Ni—P coating and without lowering the magnetic transformation temperature.

US 6,410,105 B1

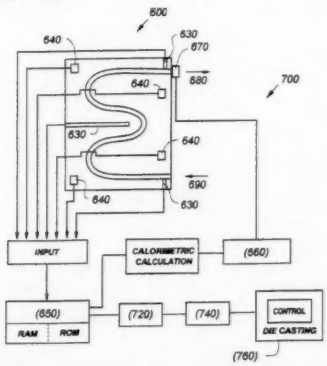
PRODUCTION OF OVERHANG, UNDERCUT, AND CAVITY STRUCTURES USING DIRECT METAL DEPOSTION

Jyoti Mazumder, 5074 Birkdale Rd., Ann Arbor, Mich. 48103; Timothy Skszek, 5473 Countryside Dr., Saline, Mich. 48176; Joseph K. Kelly, 44696 Helm St., Plymouth, Mich. 48170, and Joohyun Choi, 817 Cambridge Dr., Rolla, Mo. 65401

Continuation-in-part of application No. 09/526,631, filed on Mar. 16, 2000, which is a continuation-in-part of application No. 09/107,912, filed on Jun. 30, 1998, now Pat. No. 6,122,564, Provisional application No. 60/142,125, filed on Jul. 2, 1999. This application May 15, 2000, Appl. No. 570,986.

Int. Cl. B05D *3/00*

U.S. Cl. 427—554 **21 Claims**



1. A method of manufacturing an article having an internal void, comprising the steps of:

fabricating the article without the void on a layer-by-layer basis using a laser-aided direct metal deposition process to fabricate each layer wherein:

the body of the article is fabricated by selectively depositing, by use of the laser-aided direct metal deposition process, form a first material having a first melting point, and

the volume which will become the void is fabricated by selectively depositing, by use of the laser-aided direct metal deposition process, a second material having a second melting point which is lower than the first melting point, thereby producing a completed article; and

heating the completed article at a temperature above the second melting point so that the second material flows out of the article to create the void.

US 6,410,106 B2

METHOD OF FORMING AN INTERMETAL DIELECTRIC LAYER

Cheng-Yuan Tsai, Yunlin Hsien; Chih-Chien Liu, Taipei, and Ming-Sheng Yang, Hsinchu, all of Taiwan, assignors to United Microelectronics Crop., Hsinchu, Taiwan

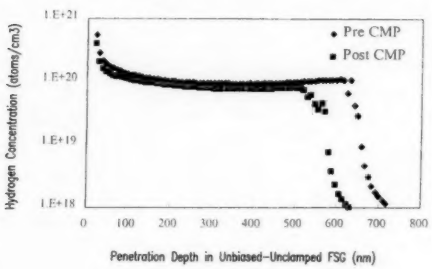
Continuation of application No. 09/471,055, filed on Dec. 22, 1999, now Pat. No. 6,200,653. This application Jan. 11, 2001, Appl. No. 759,570.

Claims priority, application Taiwan, Oct. 22, 1999, 88118307 A

This patent is subject to a terminal disclaimer.

Int. Cl. H05H *1/24*

U.S. Cl. 427—579 **4 Claims**



1. A method for forming an intermetal dielectric layer, comprising:

providing a substrate;

forming a plurality of metal conductive lines on the substrate, wherein a tied conductive line region and a loose conductive line region consist of the plurality of metal conductive lines;

forming a biased-clamped intermetal dielectric layer on the substrate;

forming an unbiased-unclamped protection layer on the biased-clamped intermetal dielectric layer wherein the unbiased-unclamped protection layer is thinner than the biased-clamped intermetal dielectric layer;

forming a cap layer on the unbiased-unclamped protection layer; and

exposing the protection layer.

US 6,410,107 B2

METHODS FOR MANUFACTURING AN ELECTROSTATIC ACTUATOR

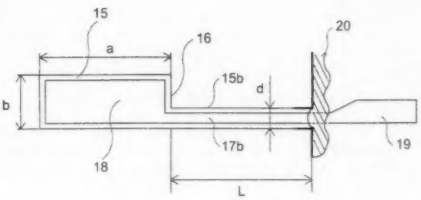
Kazuhiko Sato; Hiroyuki Maruyama; Masahiro Fujii; Tadaaki Hagata; Koji Kitahara, and Keiichi Mukaiyama, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Division of application No. 08/993,788, filed on Dec. 19, 1997, now Pat. No. 6,190,003. This application Nov. 30, 2000, Appl. No. 727,090.

Claims priority, application Japan, Dec. 20, 1996, 8-342213; Oct. 16, 1997, 9-284127

Int. Cl. B05D *5/12*

U.S. Cl. 427—581 **17 Claims**



1. A method for manufacturing an electrostatic actuator that includes a first electrode having a first surface and a second electrode having a second surface opposing the first surface with a gap disposed therebetween, and a hydrophobic film formed on at least one of the first and second surfaces, said method comprising the steps of:

depositing a hydrophobic film on at least one of the first and second surfaces, said hydrophobic film being formed from a compound selected from the group consisting of hexamethyl-disilazane, hexaethyldisilazane, trimethylchlorosilane, triethylchlorosilane, trimethyaminosilane, triethyaminosilane, and dimethyl-dichlorosilane; and

sealing airtight the gap between the first and second opposing surfaces.

US 6,410,108 B1

DEGRADABLE CONTAINER AND A METHOD OF FORMING SAME

Qiang Liu; Jun Wang; Zhengchu Bin; Chuxun Lu; Xiangshan Ding, all of Zhuzhou, China, and Kam Pui Tang, Yuen Long, The Hong Kong Special Administrative Region of the People's Republic of China, assignors to CS Environmental Technology Ltd. Hong Kong, The Hong Kong Special Administrative Region of the People's Republic of China

Division of application No. 09/023,123, filed on Feb. 13, 1998, now Pat. No. 6,074,587. This application Apr. 7, 2000, Appl. No. 544,454.

Int. Cl. B27M *3/00;* **B29D** *22/00;* **B32B** *23/04*

U.S. Cl. 428—35.6 **13 Claims**

1. A degradable container comprising from 60 wt % to 70 wt % of a plant fibre, from 10 wt % to 30 wt % of an adhesive and from 0.1 wt % to 5 wt % of a demoulding agent, wherein said adhesive is a modified urea-formaldehyde resin.

US 6,410,109 B1

RESIN COMPOSITION AND USAGE THEREOF

Kenji Shachi, and Kazushige Ishiura, both of Tsukuba, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Dec. 31, 1997, Appl. No. 2,081

Claims priority, application Japan, Jan. 10, 1997, 9-014658; Jan. 10, 1997, 9-014659

Int. Cl. B65D *41/00*

U.S. Cl. 428—36.6 **10 Claims**

1. A closure,

(1) which is a closure for a container,

(2) wherein at least a sealing element of the closure is formed of a resin composition comprising as principal components (A) a polyolefin resin, (B) a vinyl alcohol copolymer and (C) an elastomer which is a block copolymer containing an aromatic vinyl polymer block (block (a)) and an isobutylene polymer block (block (b)); said component (B) being contained in an amount of 10 to 1000 parts by weight per 100 parts by weight of the component (A) and the component (C) being contained in an amount of 5 to 100 parts by weight per 100 parts by weight, in total, of the components (A) and (B); said resin composition being prepared by mixing said components (A), (B) and (C) under melting conditions; said resin composition satisfying the following conditions: [a]>[b] and [c]>[b], where the melt viscosities of the components (A), (B) and (C) are represented by [a], [b] and [c], respectively as measured at the same temperature under said melting conditions and at a shear rate of 100 sec^{-1}.

US 6,410,110 B1

PIPE MADE FROM METATHESIS POLYMERIZED OLEFINS

Mark W. Warner, Benton; Steven D. Drake, Sherwood; Larry L. Cagle, Little Rock, all of Ark., and Charles S. Woodson, Conroe, Tex., assignors to A.O. Smith Corp., Milwaukie, Wis., and Cymetech, LLC, Hunstville, Tex.

Provisional application No. 60/058,091, filed on Sep. 5, 1997, Provisional application No. 60/057,959, filed on Sep. 5, 1997. This application Sep. 4, 1998, Appl. No. 148,834.

This patent is subject to a terminal disclaimer.

Int. Cl. B29C *41/04;* **F16L** *9/27*

U.S. Cl. 428—36.9 **3 Claims**

1. A method of making a polyolefin pipe or pipe fitting, the method comprising the steps of:

a) adding a Ru or Os metathesis catalyst to at least one cyclic olefin monomer comprising dicyclopentadiene to form a reaction mixture consisting essentially of the catalyst and the monomer;

b) forming the reaction mixture into a shape for the article, wherein the article is a pipe or a pipe fitting; and

c) allowing the formed reaction mixture to polymerize under polymerization conditions.

US 6,410,111 B1

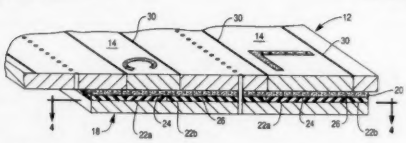
SELECTIVE RELEASE LABEL SHEET

Joseph D. Roth, Springboro, Ohio, and Wayne D. Finster, Viroqua, Wis., assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 10, 1998, Appl. No. 151,000

Int. Cl. B42D *15/00*

U.S. Cl. 428—40.1 **22 Claims**



1. A label sheet comprising:

a label;

a release liner having a plurality of different release coatings thereon adjoining each other to collectively underlie said label; and

an adhesive removably bonding together said label and liner in adjoining relatively low and high release bonds corresponding with said different release coatings, with said adhesive being directly bonded to said release coatings, and said release coatings being directly bonded to said release liner for retention thereto upon removal of said label and adhesive therefrom.

US 6,410,112 B1

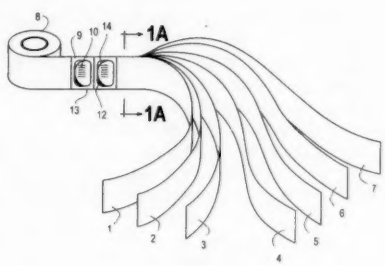
MULTI-PART PRESSURE SENSITIVE LABEL AND METHOD FOR MANUFACTURE

Ray Hatfield, Waynesville, Ohio, assignor to Intermec IP Corporation

Filed Jun. 9, 2000, Appl. No. 591,295

Int. Cl. B42D *15/00;* **B32B** *7/12*

U.S. Cl. 428—40.1 **7 Claims**



1. A multi-layer label/tag assembly comprising:

a top face sheet,

a first release liner,

a dry gum type adhesive bonding the top face sheet with the first release liner, and

a second release liner bonded to the first release liner by a pressure-sensitive adhesive,

wherein the top face sheet is removable from the first release liner for use as a tag, and is removable from the second release liner for use as a label.

7. A method for forming a multi-layer label/tag assembly, comprising the steps of:

bonding a top face sheet to a first release liner by providing a dry gum type adhesive between them,

bonding the first release liner to a second release liner by providing a pressure-sensitive adhesive between them,

bonding the second release liner to a third release liner by providing a pressure-sensitive adhesive between them,

cutting through the top face sheet to the dry gum adhesive at a first location to form a tag edge,

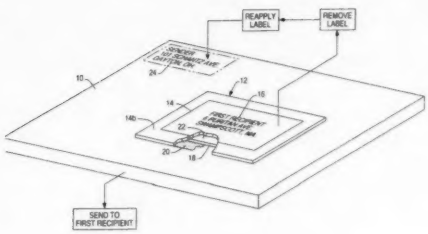
cutting through the top face sheet and the first release liner to the first pressure sensitive adhesive at a second location to form a first label edge, and

cutting through the top face sheet, the first release liner, and the second release liner to the second pressure-sensitive adhesive to form a second label edge, wherein the top face sheet may be removed by gripping the tag edge for use as a tag, a top face sheet and the first release liner may be removed together for use as a liner, and the top face sheet, the first release liner, and the second release liner may be removed together for use first as a label, and thereafter as a label or a tag.

US 6,410,113 B1
DUAL SKIP LABEL LAMINATE

Joseph D. Roth, Springboro, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 29, 1999, Appl. No. 408,240
Int. Cl. B42D *15/00*
U.S. Cl. 428—41.8 **20 Claims**



1. A label laminate comprising:

an adhesive label having an adhesive covering a back surface of said label except for a portion of said label defining a skip devoid of said adhesive;

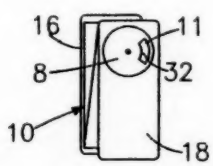
a release liner having a surface release thereon except for a portion of said liner defining a release skip devoid of said release; and

said label being laminated atop said liner by said adhesive and release thereof, with said label and adhesive being peelably removable from said liner, and with said adhesive skip being aligned atop said release skip for preventing bonding thereat.

US 6,410,114 B1
FOLDED SHEET MATERIALS

George Wallace McDonald, Mon Cachet, Rue de la Cache, Castel, Guernsey, Channels Islands, United Kingdom

Filed Dec. 21, 1999, Appl. No. 468,563
Claims priority, application United Kingdom, Dec. 23, 1998, 9828499
Int. Cl. B32B *3/04*
U.S. Cl. 428—64.1 **25 Claims**

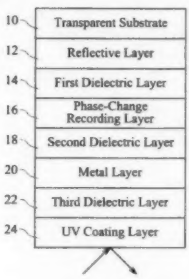


1. A sheet material having a first set of folds, the sheet material further comprising a rotatable disc attached thereto, in which the sheet material is provided with a stiff portion at a segment thereof, and in which the segment at which the stiff portion is provided is at a corner of the sheet and is defined by at least one fold or edge of the sheets.

US 6,410,115 B1
MULTI-REWRITABLE OPTICAL RECORDING MEDIUM WITH SURFACE PLASMON SUPER-RESOLUTION LAYER

Din Ping Tsai, Taichung, and Chwei-Jin Yeh, Taipei, both of Taiwan, assignors to Ritek Corporation, Hsin Chu, Taiwan

Filed Feb. 26, 2000, Appl. No. 514,077
Claims priority, application Taiwan, Feb. 26, 1999, 088203065
Int. Cl. B32B *3/02*
U.S. Cl. 428—64.1 **9 Claims**



1. A high density multi-rewritable optical recording medium comprising:

a transparent substrate;

a first dielectric layer formed on said transparent substrate;

a phase-change recording layer formed on said first dielectric layer;

a second dielectric layer formed on said phase-change recording layer;

a metal layer formed on said second dielectric layer;

a third dielectric layer formed on said metal layer; and

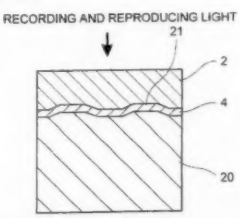
a UV coating layer formed on said third dielectric layer,

whereby a surface plasmon is generated in the interface between said third dielectric layer and said metal layer when a laser beam with a wavelength in the range from 300 nm to 800 nm irradiates toward said UV coating layer, and obtains the enhancement effect of the near-field intensity so as to achieve a high resolution for distinguishing minute pits.

US 6,410,116 B1
OPTICAL INFORMATION MEDIUM AND ITS FABRICATION PROCESS

Hideki Hirata, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Mar. 20, 2000, Appl. No. 531,457
Claims priority, application Japan, Mar. 19, 1999, 11-076963
Int. Cl. B32B *3/02*
U.S. Cl. 428—64.1 **11 Claims**



1. An optical information medium comprising a supporting substrate, an information recording surface provided on the supporting substrate and a light-transmitting layer provided on the information-recording surface, with reproducing light incident on the information-recording surface through the light-transmitting layer, wherein:

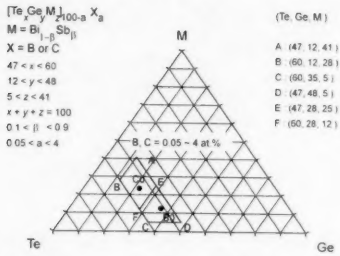
said light-transmitting layer is obtained by curing a resin layer containing an ultraviolet curing cationic resin.

US 6,410,117 B1

REWRITABLE PHASE-CHANGE OPTICAL RECORDING COMPOSITION AND REWRITABLE PHASE-CHANGE OPTICAL DISK

Tsung-Shune Chin, and Chien-Ming Lee, both of Hsinchu, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Dec. 27, 2000, Appl. No. 748,986
Claims priority, application Taiwan, Aug. 10, 2000, 89116137
Int. Cl. B32B *3/02*
U.S. Cl. 428—64.1 **26 Claims**



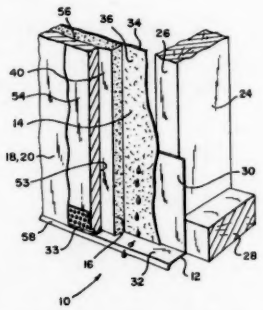
1. A rewritable phase-change optical information recording composition having a formula of $[Te_xGe_y(Bi_{1-\beta}Sb_\beta)_z]_{100-a}X_a$, wherein X is boron or carbon; x=47~60 atomic percentage (at. %); y=12~48 at. %; z =5~41 at. %, and x+y+z=100 at. %; β=0.1~0.9; and a=0.05~4 at. %.

US 6,410,118 B1

WATER DURABLE BOARD FOR EXTERIOR WALL ASSEMBLY WATER MANAGEMENT SYSTEM

James Reicherts, Cary; Timothy Tonyan, Wheaton; John Lankford, Lindenhurst, and Timothy Kenny, Libertyville, all of Ill., assignors to USG Interiors, Inc., Chicago, Ill.

Filed Nov. 14, 1997, Appl. No. 971,025
Int. Cl. B32B *3/10;3/00;* **D06N** *7/04;* **E04B** *1/70*
U.S. Cl. 428—141 **27 Claims**



22. An exterior finishing system for a building comprising:

a weather-resistive barrier having a first surface and a second surface;

a water durable and permeable board with a water vapor permeance from about 6 perms to about 40 perms, having a first surface and a second surface, said first surface of said water durable and permeable board having a unitary water drainage texture; and,

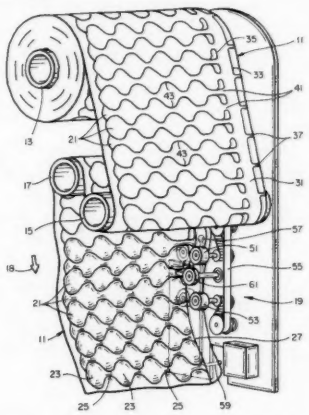
said unitary water drainage texture being adjacent to and in contact with said second surface of said weather-resistive barrier.

US 6,410,119 B1

INFLATABLE, CUSHIONING, BUBBLE WRAP PRODUCT HAVING MULTIPLE, INTERCONNECTED, BUBBLE STRUCTURES

Nicholas P. De Luca, Mill Valley; Oliver M. Reyes, Berkeley, and Philippe M. Jacques, Benicia, all of Calif., assignors to Free-Flow Packaging International, Inc., Redwood City, Calif.

Filed Nov. 21, 2000, Appl. No. 717,782
Int. Cl. B32B *3/00;* **B65D** *81/02;81/03*
U.S. Cl. 428—166 **8 Claims**



1. An inflatable, conformable, cushioning, multiple bubble strip, packaging product constructed for interposing between and in engagement with both the interior surfaces of a shipping container and the outer surfaces of one or more objects packaged within the shipping container and also constructed, when inflated, to reduce or to eliminate the transfer of shock loads from the shipping container to the objects packaged within the shipping container, said packaging product comprising,

a first sheet of film material,

a second sheet of film material,

said sheets having substantially equal lengths and substantially equal widths,

said sheets being joined together as a web in a pattern of seal lines,

said pattern of seal lines forming an inflation channel extending linearly along the length of the sheets for receiving pressurized air from an outlet end of an inflation tube disposed within the inflation channel at an inflation station as the sheets are transported past the sealing station in the process of inflating and sealing strips of multiple bubble cushioning structures in the packaging product,

said pattern of seal lines also forming a plurality of individual inflatable strips of multiple bubble cushioning structures extending laterally from said inflation channel,

each individual inflatable strip having a plurality of bubble chambers with each bubble chamber interconnected to an adjacent bubble chamber by an interconnecting passageway which is smaller in size and internal volume than the bubble chambers but which is sufficiently large to enable air volume and pressure in one inflated bubble chamber to be transmitted to adjacent bubble chambers for distributing a shock load on one bubble chamber along the entire length of the individual inflatable strip of interconnected bubble chambers,

each individual inflatable strip of multiple bubble cushioning structures having an entrance port connecting the first bubble

chamber in the strip to the inflation channel for receiving pressurized air at the inflation station to inflate all of the bubble chambers in the individual inflatable strip,

said entrance port being configured to permit the entrance port to be sealed by a line seal formed across the entrance port by a heated sealing element at a sealing station as the sheets of film material are continuously and uninterruptedly transported through the sealing station after the bubble chambers have been inflated at the inflation station, and

each individual inflatable strip being defined between two laterally extending spaced apart peripheral seal lines which have an undulating configuration free of corner shapes or sharp bends which could concentrate stresses.

US 6,410,120 B1

LAMINATED GLAZING

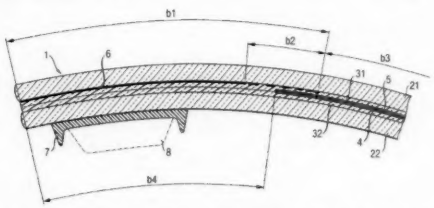
Thorsten Frost, Aachen, Germany; Hasso Gien, Heerlen, Netherlands; Manfred Jansen, Geilenkirchen, Germany; Franz Krämling; Michael Labrot, both of Aachen, Germany; Udo Matzerath, Wegberg, Germany, and Heinz Schilde, Würselen, Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Continuation of application No. 09/488,536, filed on Jan. 21, 2000, now abandoned. This application Oct. 6, 2000, Appl. No. 680,426.

Claims priority, application Germany, Jan. 22, 1999, 199 02 471

Int. Cl. B32B *3/28;17/00*

U.S. Cl. 428—174 **11 Claims**



1. A curved and transparent laminated glazing made of at least two fixed panes and of a multilayer laminate placed between them, the multilayer laminate including at least one support film provided with a thin layer and with external adhesive layers, as well as with a marginal strip of an opaque material delimiting the viewing area of the laminated glazing on at least one side, wherein the support film which extends over the viewing area is cut to size to provide a cut edge which is covered by the marginal strip at least in a direction of viewing in transmission.

US 6,410,121 B1

CERMET TOOL AND METHOD FOR MANUFACTURING THE SAME

Kohei Abukawa, Aichi, Japan, assignor to NGK Spark Plug Co. Ltd., Aichi, Japan

Filed Feb. 25, 2000, Appl. No. 513,171

Claims priority, application Japan, Feb. 26, 1999, 11-051516; Feb. 4, 2000, 2000-028245

Int. Cl. C22C *29/00*

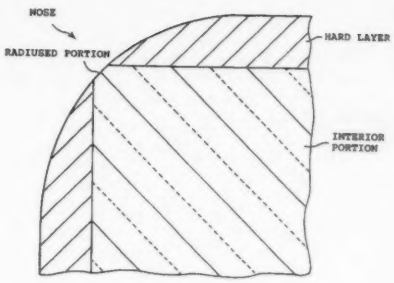
U.S. Cl. 428—195 **5 Claims**

1. A cermet tool containing as a bonding phase at least two iron-group metals and as a hard phase at least two members selected from the group consisting of carbides, nitrides, and carbonitrides of elements in Group 4A, 5A and 6A of the Periodic Table, comprising:

a sintered skin formed on a rake and/or flank face;

a nose formed at a corner of the cermet tool and having an exposure portion exposing the interior portion at the nose; and

an interior portion beneath the sintered skin;



wherein, an amount of the bonding phase decreases from the center of the interior portion to a surface of the sintered skin so that substantially no exudation of the bonding phase metal is observed at the surface, and the amount of the bonding phase contained in the sintered surface skin having a thickness of 2–20 μm measured from the surface is not greater than 11% by weight when the amount of the bonding phase as measured substantially at the center of the interior portion of the cermet tool is taken as 100% by weight.

US 6,410,122 B1

FIRE-RESISTANT SHEETLIKE MOLDING, FIRE-RESISTANT LAMINATE FOR COVERING STEEL, FIRE-RESISTANT STRUCTURE FOR WALL, AND METHOD FOR CONSTRUCTING FIRE-RESISTANT STEEL AND FIRE-RESISTANT WALL

Masaki Tono, Nagaokakyo; Bunji Yamaguchi, Takatsuki; Kazuyuki Yahara, Kyoto; Hitomi Muraoka, Takatsuki, and Norio Numata, Kyoto, all of Japan, assignors to Sekisui Chemical Co., Ltd., Osaka, Japan

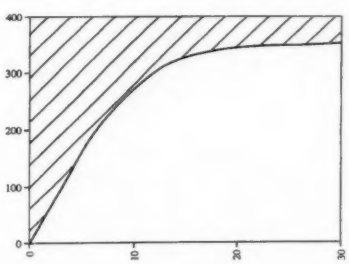
PCT No. PCT/JP97/02258, § 371 Date Sep. 2, 1999, § 102(e) Date Sep. 2, 1999, PCT Pub. No. WO98/31730, PCT Pub. Date Jul. 23, 1998

PCT Filed Jun. 30, 1997, Appl. No. 341,474

Claims priority, application Japan, Jan. 16, 1997, 9-005509; Jan. 16, 1997, 9-005510

Int. Cl. B32B *7/02;5/16;27/36;13/00;* **C08L** *71/02*

U.S. Cl. 428—212 **36 Claims**



1. A fire-resistant sheet molded article comprising a resin composition and having the relationship between the initial thickness t (mm) and the temperature difference Δ_T (° C.) between one side and the reverse side after heating of said one side at 500° C. for 1 hour as represented by:

$\Delta_T \geqq 0.015t^4 - 0.298t^3 + 1.566t^2 + 30.151t$, and having the initial bulk density at 25° C. of 0.8 to 2.0 g/cm^3 and the bulk density after 1 hour of heating at 500° C. of 0.05 to 0.5 g/cm^3.

US 6,410,123 B1

INK JET RECORDING PAPER AND THE PRODUCTION THEREOF

Teiichi Otani; Atsushi Ono; Yoshifumi Iimori; Akinobu Chatani; Noboru Kondo; Takashi Ueno, and Yoshihiro Kuroyama, all of Tokyo, Japan, assignors to Nippon Paper Industries Co. Ltd., Tokyo, Japan

Filed Dec. 27, 1999, Appl. No. 472,729

Int. Cl. B41M *5/00*

U.S. Cl. 428—212 **17 Claims**

1. An ink jet recording paper comprising a ink-receiving layer and at least two colloidal silica layers successively coated onto a support, each of said colloidal silica layers comprising chain colloidal silica as a main ingredient, wherein at least the colloidal silica layer contacting the ink-receiving layer contains no binder and has a coverage of about 1 to 3 g/m^2, and the coverage of other colloidal silica layer is about 1 to 6 g/m^2.

US 6,410,124 B1

FILMS WITH IMPROVED METALLIZABLE SURFACES

Robert G. Peet, Pittsford, N.Y., assignor to ExxonMobil Oil Corporation, Fairfax, Va.

Filed Mar. 30, 1999, Appl. No. 281,387

Int. Cl. B32B *27/32*

U.S. Cl. 428—215 **12 Claims**

1. A multi-layer film comprising:

(a) a base layer comprising a polyolefin; and

(b) at least one additional layer consisting essentially of a metallocene-catalyzed syndiotactic polypropylene having a melt flow rate of about 1 to about 15 g/10 min., wherein the the layer consisting essentially of metallocene-catalyzed polypropylene is not heat sealable.

US 6,410,125 B1

WEAR-RESISTANT, MECHANICALLY HIGHLY STRESSED AND LOW-FRICTION BOUNDARY COATING CONSTRUCTION FOR TITANIUM OR THE ALLOYS THEREOF AND A METHOD FOR PRODUCING THE SAME

Berndt Brenner, Pappritz; Steffen Bonss, Zella-Mehlis; Hans-Joachim Scheibe, Dresden, and Holger Ziegele, München, all of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung e.v., Munich, Germany

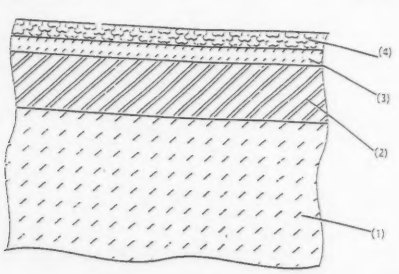
PCT No. PCT/DE98/03367, § 371 Date Jul. 24, 2000, § 102(e) Date Jul. 24, 2000, PCT Pub. No. WO99/27147, PCT Pub. Date Jun. 3, 1999

PCT Filed Nov. 10, 1998, Appl. No. 530,963

Claims priority, application Germany, Nov. 19, 1997, 197 51 337

Int. Cl. B32B *5/00;* **C23C** *26/00*

U.S. Cl. 428—216 **16 Claims**



1. A wear resistant, heavy-duty, and low-friction boundary construction for titanium and alloys thereof made of a laser gas alloyed layer having deposited titanium needles, wherein the boundary construction comprises

an outer hard amorphous carbon layer having a thickness from 200 to 400 nm,

an intermediate layer having a thickness of from 5 to 50 nm, and

an inner laser gas alloyed layer having a thickness from 0.3 to 2.0 mm

wherein the gas alloyed layer has a hardness between 600 HV0.1 and 1400 HV0.1.

US 6,410,126 B1

UNIDIRECTIONAL TAPE OF CARBON FIBERS

Jean Guevel, Viriat, and Guy Bontemps, Tenay, both of France, assignors to Sa Schappe, Ban de Laveline, France

Filed May 12, 2000, Appl. No. 570,429

Claims priority, application France, May 20, 1999, 99 06596

Int. Cl. D04H *1/00*

U.S. Cl. 428—292.1 **16 Claims**

1. A unidirectional tape of carbon fibers, wherein the fibers are discontinuous, have a length distribution such that the mean fiber length is between approximately 40 and 70% of the length of the longest fiber, as determined by comparing the mean length of 50% of the fibers in a specimen with the length of the longest fiber in the specimen, and the fibers are combined with a resin or with an adhesive having a fugitive nature.

US 6,410,127 B1

EPOXY RESIN COMPOSITIONS, EPOXY RESIN COMPOSITIONS FOR FIBER-REINFORCED COMPOSITE MATERIALS, AND FIBER-REINFORCED COMPOSITE MATERIALS COMPRISING THE SAME

Toshiya Kamae; Hiroki Oosedo; Shunsaku Noda; Shinji Kouchi, and Ryuji Sawaoka, all of Ehime, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP00/01462, § 371 Date Nov. 13, 2000, § 102(e) Date Nov. 13, 2000, PCT Pub. No. WO00/53654, PCT Pub. Date Sep. 14, 2000

PCT Filed Mar. 10, 2000, Appl. No. 700,180

Claims priority, application Japan, Mar. 11, 1999, 11-065299

Int. Cl. B32B *27/04*

U.S. Cl. 428—297.4 **19 Claims**

1. An epoxy resin composition comprising a main agent and a curing agent, the main agent comprising an aromatic epoxy resin having at least a di-functionality and the curing agent comprising an aromatic amine compound and/or an alicyclic amine compound, wherein 5 minutes after the main agent and the curing agent are mixed at 25° C., the epoxy resin composition shows a viscosity at 25° C. in a range of from about 1 to 1500 mPa sec, and Tc, tc, and Tg satisfy the following equation:

$$Tg \geqq Tc+20-k\times(Tc-90) \quad (1)$$

wherein k=0 when 60≦Tc<90 and k=0.35 when 90≦Tc≦200;

wherein Tc is a highest temperature (°C.) during the curing process and said Tc satisfies the following equation:

$$60 \leqq Tc \leqq 200;$$

tc is a retention time (min) at the highest temperature and said tc satisfies the following equation:

$$1 \leqq tc \leqq 120$$

and

Tg is a glass transition temperature of the epoxy resin composition after a lapse of tc (min) at Tc (°C.).

18. A fiber reinforced composite material comprising a reinforcing fiber and a cured product of the epoxy resin composition according to any one of claim **1** to claim **16**.

US 6,410,128 B1

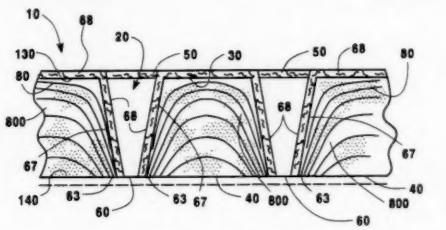
FLEXIBLE GRAPHITE CAPACITOR ELEMENT

Paul Calarco, Westlake; Robert Angelo Mercuri, Seven Hills, and Thomas William Weber, Cleveland, all of Ohio, assignors to Graftech Inc., Wilmington, Del.

Filed Mar. 13, 2000, Appl. No. 523,852

Int. Cl. B23B *3/10*

U.S. Cl. 428—313.9 **20 Claims**



1. A fluid permeable graphite article comprising a compressed mass of expanded graphite particles in the form of a sheet having parallel, opposed first and second surfaces, at least a portion of said sheet having a plurality of transverse fluid channels passing through said sheet between said first and second parallel, opposed surfaces, said channels being formed by mechanically impacting the first surface of said sheet at a plurality of locations to provide said channels with openings at both of said first and second parallel, opposed surfaces, at least one of said parallel opposed surfaces having an adherent coating of glassy carbon, wherein at least a portion of the glassy carbon coating is activated.

US 6,410,129 B2

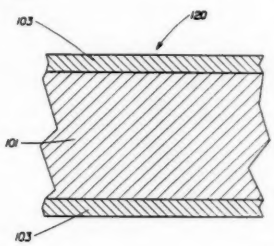
LOW STRESS RELAXATION ELASTOMERIC MATERIALS

John Jianbin Zhang; John Joseph Curro, and Michele Ann Mansfield, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of application No. 09/398,849, filed on Sep. 17, 1999, now abandoned. This application Jun. 14, 2001, Appl. No. 881,073.

Int. Cl. B32B *3/00*

U.S. Cl. 428—318.6 **35 Claims**



1. A low stress relaxation elastomeric film suitable for being formed into a porous, macroscopically-expanded, three-dimensional elastomeric web, said elastomeric material comprising an elastomeric layer having opposed first and second surfaces and at least one substantially less elastomeric skin layer substantially continuously joined to said first surface of the elastomeric layer, said elastomeric layer comprising:

a) from about 20 to about 80 wt % of an elastomeric block copolymer, said copolymer comprising from about 10% to about 80% by weight of at least one hard block and from about 20% to about 90% by weight of at least two soft block;

b) from about 3 to about 60 wt % of at least one vinylarene resin; and

c) from about 5 to about 60 wt % of a processing oil;

wherein the elastomeric film has a stress relaxation of less than about 20 percent at 200% elongation at room temperature and a stress relaxation of less than about 45 percent after about 10 hours at 100° F. and 50% elongation.

US 6,410,130 B1

COATINGS WITH A CHOLESTERIC EFFECT AND METHOD FOR THE PRODUCTION THEREOF

Peter Schuhmacher, Mannheim; Norbert Schneider, Altrip; Volker Richter, Heidelberg; Harald Keller; Peter Blaschka, both of Ludwigshafen; Günter Bettinger, Schifferstadt; Frank Meyer, Mannheim; Erich Beck, Ladenburg; Karl Siemensmeyer, Frankenthal; Helmut Steininger, Worms, and Wolfgang Best, Freinsheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

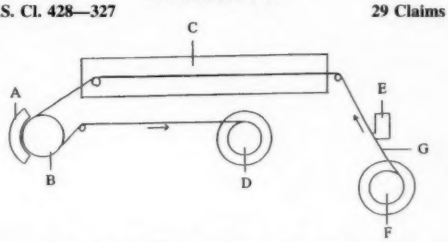
PCT No. PCT/EP98/05544, § 371 Date Mar. 2, 2000, § 102(e) Date Mar. 2, 2000, PCT Pub. No. WO99/11733, PCT Pub. Date Mar. 11, 1999

PCT Filed Sep. 1, 1998, Appl. No. 486,695

Claims priority, application Germany, Sep. 2, 1997, 197 38 369; Dec. 23, 1997, 197 57 699

Int. Cl. B32B *5/16*

U.S. Cl. 428—327 **29 Claims**



1. A process for producing a cholesteric layer that comprises:

applying at least one layer of a curable, pourable cholesteric mixture to a substrate and forming a solid cholesteric layer,

wherein said solid cholesteric layer has a mean fluctuation in layer thickness of less than ±0.2 μm.

US 6,410,131 B1

FLEXIBLE LUSTERED PRODUCTS

Kenji Kawazu, Aichi-ken; Sonoko Nishimoto, Toyota; Yukitaka Hasegawa, Inazawa, and Yasuhiko Ogisu, Nagoya, all of Japan, assignors to Toyoda Gosei Co., Ltd., Aichi-ken, and Toyoda Jidosha Kabushiki Kaisha, Tokyo, both of Japan

Filed May 18, 1998, Appl. No. 80,291

Claims priority, application Japan, May 19, 1997, 9-128883; May 19, 1997, 9-128884; Apr. 27, 1998, 10-117120

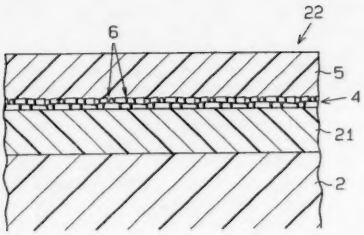
Int. Cl. B32B *15/08*

U.S. Cl. 428—336 **19 Claims**

1. A flexible lustered product comprising:

a base material made of a resin;

a base coat layer formed on at least a portion of a surface of the base material, wherein the base coat layer has a glass transition point that is at least about −30° C. and at most about 0° C., wherein the base coat layer includes a silane coupling agent having a mercapto group, wherein the base coat layer further includes a urethane compound that has at least one and at most eight residual hydroxyl moieties per molecule, and



wherein said urethane compound is formed by a reaction between a polyesterpolyol having between three and ten hydroxyl moieties per molecule prior to reaction and a diisocyanate, wherein the polyesterpolyol and the diisocyanate are present in the same molar concentration;

a metal film layer applied to at least a portion of a surface of the base coat layer, wherein the metal film layer is anticorrosive and has a thickness that is at least 150 Å and at most 800 Å, and wherein the metal film layer is formed by a plurality of metal particles disposed in contact with one another so as to define a grain boundary between adjacent metal particles; and

a top coat layer formed on at least a portion of a surface of the metal film layer.

US 6,410,132 B1

BIAXIALLY ORIENTED POLYPROPYLENE FILM, THE USE OF THE FILM AND PROCESS FOR ITS PRODUCTION

Herbert Peiffer, Mainz; Richard Lee Davis, Wiesbaden, and Joerg Hellmann, Mainz, all of Germany, assignors to Mitsubishi Polyester Film GmbH, Wiesbaden, Germany

Filed Sep. 15, 1999, Appl. No. 396,514

Claims priority, application Germany, Sep. 16, 1998, 198 42 376

Int. Cl. B32B *15/08;* **B29C** *55/12*

U.S. Cl. 428—336 **29 Claims**

1. A biaxially oriented polypropylene film with one or more layers, comprising at least a base layer composed of at least 50% by weight of a polypropylene, wherein the planar orientation delta p of the film is greater than about 0.0138, and wherein the refractive index n_{ND} in the direction of the thickness of the film is less than about 0.1495.

US 6,410,133 B1

MAGNETIC RECORDING DISK, METHOD OF THE MAGNETIC RECORDING DISK AND MAGNETIC RECORDING APPARATUS

Fumiyoshi Kirino, Tokyo; Nobuyuki Inaba, Hasuda; Ken Takahashi, Tokai; Takashi Naitou, Hitachiota; Sumio Hosaka, Hinode; Eiji Koyama, Tsuchiura; Motoyasu Terao, Hinode; Hiroki Yamamoto, Hitachi, and Hiroki Kuramoto, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 6, 2000, Appl. No. 478,377

Claims priority, application Japan, Jan. 7, 1999, 11-001667

Int. Cl. G11B *5/66;5/70;5/82*

U.S. Cl. 428—336 **6 Claims**

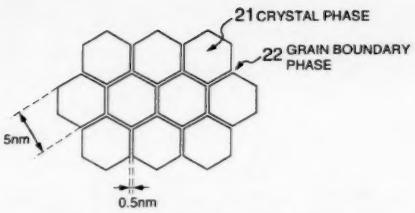
1. A magnetic recording medium comprising

a nonmagnetic substrate,

an inorganic compound layer including a crystalline first oxide and a crystalline second oxide, said inorganic compound layer being formed on the substrate, and

a magnetic layer formed on said inorganic compound layer,

wherein said crystalline first oxide comprises at least one oxide selected from the group consisting of cobalt oxide, chromium oxide, iron oxide and nickel oxide,



said second oxide comprising at least one oxide selected from the group consisting of silicon oxide, aluminum oxide, titanium oxide, tantalum oxide and zinc oxide, and

said second oxide is present at a grain boundary of crystal grains of said first oxide,

wherein said inorganic compound layer has a thickness of 10–100 nm.

US 6,410,134 B1

AQUEOUS SILICONE COATING COMPOSITION AND POLYESTER RELEASE FILMS COATED THEREWITH

Eung-Sik Park, Seoul, and Jong-Seob Won, Seongnam-si, both of Rep. of Korea, assignors to SKC Limited, Kyungki-do, Rep. of Korea

Filed Aug. 9, 2000, Appl. No. 635,993

Claims priority, application Rep. of Korea, Aug. 9, 1999, 99-32564

Int. Cl. B32B *27/08;27/28;27/36*

U.S. Cl. 428—336 **8 Claims**

1. An aqueous silicone coating composition comprising an alkylvinylpolysiloxane; 1.5 to 10 percent by weight, based on the amount of the alkylvinylpolysiloxane, of an alkylhydrogenpolysiloxane; 10 to 500 ppm, based on the amount of the alkylvinylpolysiloxane, of a platinum complex catalyst; and 0.5 to 20 percent by weight, based on the amount of the alkylvinylpolysiloxane, of a water-soluble polyester resin.

US 6,410,135 B1

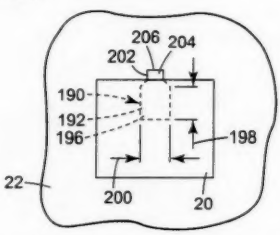
STRETCH RELEASING ADHESIVE TAPE WITH DIFFERENTIAL ADHESIVE PROPERTIES

Michael D. Hamerski, Township of Baldwin, Wis., and James L. Bries, Cottage Grove, Minn., assignors to 3M Innovative Properties Company, St. Paul, Minn.

Filed Jan. 21, 2000, Appl. No. 489,361

Int. Cl. C09J *7/00;7/02*

U.S. Cl. 428—343 **18 Claims**



1. A stretch releasing adhesive tape article with differential adhesive properties in an uncompressed state and a compressed state, comprising:

an elongated length of stretch releasing adhesive tape comprising at least one potential contact surface area, at least a portion of the potential contact surface area comprising an adhesive surface having at least one raised portion, the potential contact surface area comprising a first interface surface area in the uncompressed state and a second interface surface

area substantially greater than the first interface surface area in the compressed state.

US 6,410,136 B1

POLYOLEFIN FILMS SUITABLE FOR INSTITUTIONAL APPLICATIONS

Mark Thomas DeMeuse, New Castle County, Del., assignor to Applied Extrusion Technologies, Inc., New Castle, Del.

Filed Nov. 16, 1999, Appl. No. 442,178
Int. Cl. B32B *27/32;* **C08F** *23/04*
U.S. Cl. 428—347 **15 Claims**

1. A biaxially oriented film comprised of a polyolefin mixture consisting essentially of:

a) more than about 10% by weight to about 60% by weight of isotactic polypropylene,

b) about 10% by weight to about 25% by weight of low density polyethylene having a density no greater than about 0.935 g/cc and

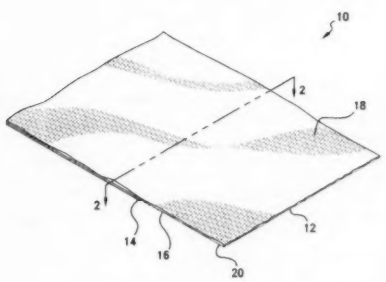
c) about 15% by weight to less than 80% by weight of an olefin heteropolymer containing propylene and at least one other α-olefin of 2 to 4 carbon atoms.

US 6,410,137 B1

INTUMESCENT, FLAME RETARDANT PRESSURE SENSITIVE ADHESIVE COMPOSITION FOR EMI SHIELDING APPLICATIONS

Michael H. Bunyan, Chelmsford, Mass., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Provisional application No. 60/105,271, filed on Oct. 22, 1998. This application Oct. 4, 1999, Appl. No. 412,059.
Int. Cl. B32B *15/04;7/12;19/00*
U.S. Cl. 428—356 **27 Claims**



1. A flame retardant, EMI shielding material comprising:

an electrically-conductive layer having first surface and a second surface; and

a flame retardant pressure sensitive adhesive (PSA) layer disposed on one or both of said first or second surface of said electrically-conductive layer, said PSA layer being formed of an intumescent PSA composition comprising an admixture of:

(a) a PSA component;

(b) a halogenated first flame retardant component;

(c) a metal-based second flame retardant component; and

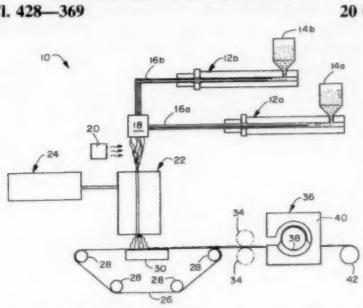
(d) a filler component of expandable, intercalated graphite particles.

US 6,410,138 B2

CRIMPED MULTICOMPONENT FILAMENTS AND SPUNBOND WEBS MADE THEREFROM

Mark M. Mleziva, Appleton, Wis.; Samuel E. Marmon, Alpharetta, Ga.; Christopher C. Creagan, Marietta, Ga.; Darryl F. Clark, and Kurtis L. Brown, both of Alpharetta, Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Sep. 30, 1997, Appl. No. 940,886
Int. Cl. D01D *5/22;5/30;* **D02G** *3/02*
U.S. Cl. 428—369 **20 Claims**



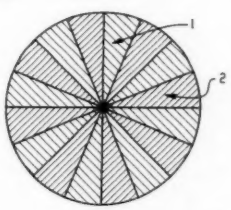
1. A naturally crimped multicomponent filament comprising at least a first polymeric component and a second polymeric component, said first polymeric component having a faster solidification rate than said second polymeric component, said filament containing a crimp enhancement additive comprising a butylene-propylene random copolymer, wherein the units of said copolymer consists of butylene and propylene, said crimp enhancement additive being added in an amount sufficient for said filament to have at least 10 crimps per inch, said multicomponent filament having a linear density of less than about 2 denier.

US 6,410,139 B1

SPLIT TYPE CONJUGATE FIBER, METHOD FOR PRODUCING THE SAME AND FIBER FORMED ARTICLE USING THE SAME

Toshihiko Tsutsui; Mitsuru Kojima; Masayasu Suzuki; Kazuyuki Sakamoto, and Masaru Nishijima, all of Shiga, Japan, assignors to Chisso Corporation, Osaka, Japan

PCT No. PCT/JP00/01180, § 371 Date Oct. 31, 2000, § 102(e) Date Oct. 31, 2000, PCT Pub. No. WO00/53831, PCT Pub. Date Sep. 14, 2000
PCT Filed Feb. 29, 2000, Appl. No. 674,384
Claims priority, application Japan, Mar. 8, 1999, 11-060134; Mar. 11, 1999, 11-065180; Mar. 17, 1999, 11-072583; Jun. 11, 1999, 11-164851; Jul. 19, 1999, 11-204851; Dec. 24, 1999, 11-367309
Int. Cl. D01F *8/00*
U.S. Cl. 428—373 **6 Claims**



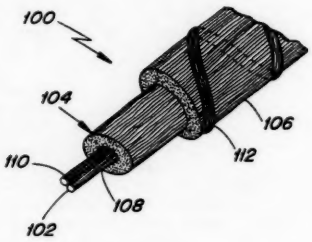
1. A splittable polyolefin multi-component fiber comprising at least two polyolefin resin components and having a hollow in its center, which is characterized in that the individual constituent components are alternately radially aligned around the hollow in-its cross section, the percentage of its hollowness falls between 5 and 40%, and the ratio of the mean length, W, of the outer

peripheral arc of one constituent resin component to-the mean thickness, L, of the component between the end of the hollow and the outer periphery of the fiber, W/L, falls between 0.25 and 2.5.

US 6,410,140 B1
FIRE RESISTANT CORESPUN YARN AND FABRIC COMPRISING SAME

Frank J. Land, Island Park, N.Y., and Alan C. Handermann, Asheville, N.C., assignors to BASF Corporation, Enka, and McKinnon-Land, LLC, Charlotte, both of N.C.

Continuation-in-part of application No. 09/406,732, filed on Sep. 28, 1999, now Pat. No. 6,146,759. This application Nov. 14, 2000, Appl. No. 710,893.
Int. Cl. D01F *6/00*
U.S. Cl. 428—377 **28 Claims**



1. A fire resistant corespun yarn, comprising:

a core of high temperature resistant continuous inorganic filaments;

a first sheath of staple fibers surrounding the core, wherein the staple fibers comprise fibers of at least one fire resistant material selected from the group consisting of meta-aramids, para-aramids, fluoropolymers and copolymers thereof, chloropolymers, polybenzimidazole, polyimides, polyamideimides, partially oxidized polyacrylonitriles, novoloids, poly (p-phenylene benzobisoxazoles), poly (p-phenylene benzothiazoles), polyphenylene sulfides, flame retardant viscose rayons, polyvinyl chloride homopolymers and copolymers thereof, polyetheretherketones, polyketones, polyetherimides, polylactides, and combinations thereof; and

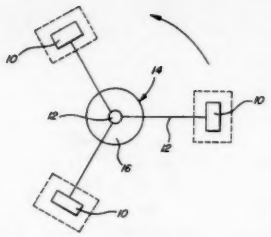
a second sheath of staple fibers surrounding the first sheath.

US 6,410,141 B1
MATERIAL AND PROCESS FOR MANUFACTURING PLASTIC PARTS

Robert A. Grimmer, Berwick, Me., assignor to Davidson Textron Inc., Troy, Mich.

Continuation of application No. 08/900,973, filed on Jul. 25, 1997, now Pat. No. 5,998,030, which is a continuation of application No. 08/451,402, filed on May 26, 1995, now Pat. No. 5,654,102, which is a division of application No. 08/267,252, filed on Jun. 29, 1994, now Pat. No. 5,525,274. This application Sep. 16, 1999, Appl. No. 397,592.
This patent is subject to a terminal disclaimer.
Int. Cl. B32B *33/00;* **B29B** *9/10*
U.S. Cl. 428—402 **71 Claims**

1. A process for manufacturing plastic shells comprising the steps of providing a charge of thermoplastic microspheres melt blended with pigment, said microspheres having an outside diameter in the range of 0.007" to 0.040"; providing a mold; placing said charge of microspheres into said mold; melt flowing the material into a shape corresponding to the mold surface and cooling the molded shape to remove said shape from the mold.



US 6,410,142 B1
SPS NANOCOMPOSITE AND PROCESSES FOR PRODUCING THE SAME

In-Mau Chen, Chu-Pang; Wen-Faa Kuo, Hsinchu; Hsien-Yin Tsai, Tainan, and Jeng-Yue Wu, Taichung, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jul. 14, 2000, Appl. No. 617,128
Claims priority, application Taiwan, May 9, 2000, 89108801 A
Int. Cl. B32B *5/16*
U.S. Cl. 428—402 **31 Claims**

1. A syndiotactic polystyrene/clay nanocomposite comprising:

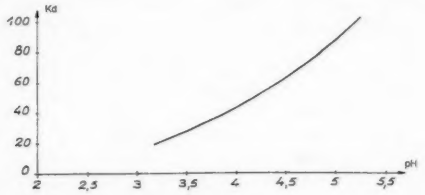
a polymer matrix comprising syndiotactic polystyrene (sPS); and

a layered clay material uniformly dispersed in the polymer matrix, said layered clay material being intercalated with an organic onium cation, and the interlayer distances of said layered clay material being at least 20Å.

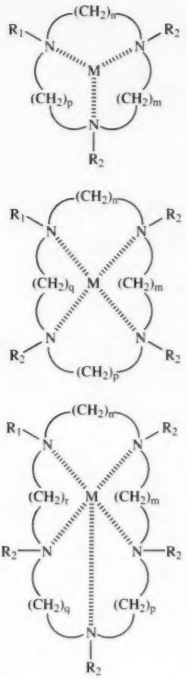
US 6,410,143 B1
POLYAZACYCLOALKANES, TRI-, TETRA- OR PENTA-AZAMACROCYCLIC COMPLEXES, PROCESSES FOR THE PRODUCTION OF THESE SUBSTITUTED OR UNSUBSTITUTED POLYAZACYCLOALKANES GRAFTED TO A SUPPORT AND USES OF POLYAZACYCLOALKANES AND THE AFOREMENTIONED COMPLEXES

Roger Guilard, Fontaine les Dijon; Hervé Chollet, Asnieres les Dijon; Philippe Guiberteau, Messigny, and Panayotis Cocolios, Le Chesnay, all of France, assignors to Commissariat a l'Energie Atomique and Air, Paris, France

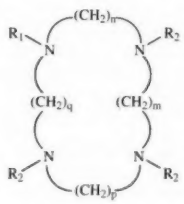
Continuation of application No. 09/189,805, filed on Nov. 12, 1998, now Pat. No. 6,174,505, which is a division of application No. 08/646,330, filed as application No. PCT/FR95/01287, filed on Oct. 4, 1995, now Pat. No. 5,891,574. This application Sep. 22, 2000, Appl. No. 667,506.
Claims priority, application France, Oct. 5, 1994, 94 11904
Int. Cl. B32B *5/16;* **C07C** *255/02*
U.S. Cl. 428—403 **4 Claims**



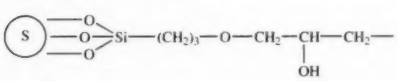
1. Tri-, tetra- and penta-azamacrocyclic complexes O transition metals of formulas (IV), (V) or (VI):



in which n, m, p, q and r, which can be the same or different, are equal to 2 or 3, M is a transition metal that is selected from the group consisting of Ti, Mn, Fe, CO, Ni, Cu, Ru, Rh and Ir, R_1 is a solid support and R_2 represents a hydrogen atom or the group $(CH_2)_2$—R_3, R_3 is a functional group that is selected from the group consisting of COOH, $CONH_2$, CH_2OH, CN and $COOR_4$, R_4 representing an alkyl or benzyl group, or R_2 representing (CH_2)—R_5, R_5 representing COOH or PO_3R_6, and R_6 representing hydrogen or an alkyl group, with the exclusion (a) of polyazacycloalkanes of formula (II):



in which R_1 represents a solid support derived from silica and complying with the formula:



(IV) S representing a silca gel, each R_2 represents a hydrogen atom and (i) n and p are equal to 2 and m and q are equal to 3 or (ii) n and p are equal to 3 and m and q are equal to 2 and and (b) polyazacycloalkanes of formula (II) in which R_1 represents a solid support consisting of an organic polymer and each R_2 represents a hydrogen atom.

US 6,410,144 B2

(V) **LUBRICIOUS DIAMOND-LIKE CARBON COATINGS**

Geoffrey Dearnaley, San Antonio, and Mark Van Dyke, Fair Oaks Ranch, both of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Continuation-in-part of application No. 09/026,451, filed on Feb. 19, 1998, now Pat. No. 6,001,481, which is a continuation-in-part of application No. 08/662,728, filed on Jun. 10, 1996, now Pat. No. 5,863,621, which is a continuation-in-part of application No. 08/400,612, filed on Mar. 8, 1995, now abandoned. This application Jun. 29, 1999, Appl. No. 342,542.

(VI) **Int. Cl. B32B** *9/00*

U.S. Cl. 428—408 **72 Claims**

1. A film of amorphous carbon comprising a surface and comprising a quantity of sulfur comprising a dispersion in said film, said quantity and said dispersion being effective to produce a reduced coefficient of friction at said surface compared to a coefficient of friction of an amorphous carbon surface absent said sulfur.

US 6,410,145 B1

THERMOSETTING RESIN COMPOSITION FOR BUILD-UP

Toshiaki Hayashi, Tsukuba; Nobuyuki Nakajima, Niihama, and Noriaki Saito, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 27, 2000, Appl. No. 604,528

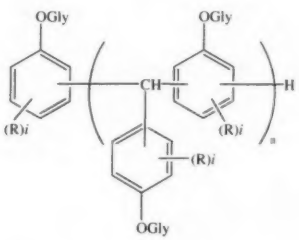
Claims priority, application Japan, Jul. 2, 1999, 11-188978

Int. Cl. B32B *15/08*

U.S. Cl. 428—418 **4 Claims**

1. An insulation layer having a thickness of 10 to 300 μm used for build-up method, wherein the layer is formed by curing a thermosetting resin composition comprising (A) an epoxy resin represented by formula (I), (B) a curing agent for epoxy resin, and (C) a poly(ether sulfone),

(I)



in the formula, Gly represents glycidyl group; R represents each independently, an alkyl group having 1 to 10 carbons, a cycloalkyl group having 5 to 7 carbons, or a hydrocarbon group having 6 to 20 carbon atoms which contains a cycloalkyl group having 5 to 7 carbons; i represents each independently a numeral of 0 to 4; when i is 2 or more, R may be the same or different from each other; and n represents a repeating number of 1 to 10.

3. An insulating material for build-up method having the layer of claim **1** or **2**.

4. A build-up print circuit board formed by using the insulating material of claim **3**.

US 6,410,146 B2
CATIONIC ELECTRODEPOSITION COATING COMPOSITION

Shinsuke Shirakawa, Osaka-fu; Keisuke Tsutsui, Hyogo-ken, and Mitsuo Yamada, Osaka-fu, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka-fu, Japan

Filed Jan. 5, 2001, Appl. No. 754,140

Claims priority, application Japan, Jan. 7, 2000, 2000-001435

Int. Cl. B32B *15/08;27/38*

U.S. Cl. 428—418 **4 Claims**

1. A cationic electrodeposition coating composition, comprising a cationic group-containing epoxy modified base resin and a blocked isocyanate curing agent, wherein the blocked isocyanate curing agent is obtained by reacting a polyisocyanate compound with a terminal primary OH-containing propylene glycol monoalkyl ether as a blocking agent, wherein the terminal primary OH-containing propylene glycol monoalkyl ether has the formula:

$$RO(CH(CH_3)CH_2O)_nH$$

and wherein R is an alkyl group having 1 to 8 carbons which is branched or straight and n is 1 to 3.

2. The cationic electrodeposition coating composition according to claim **1**, in which said polyisocyanate compound is diphenylmethane diisocyanate, and R in the formula is a n-butyl group and n is 1 to 2.

4. An electrodeposition-coated article, which is coated using the cationic electrodeposition coating composition according to claim **2**.

US 6,410,147 B1
LOW GLOSS CROSSLINKABLE COATING COMPOSITIONS

Ding-Yu Chung, Rochester Hills; Isidor Hazan, Southfield, and Donald Albert Paquet, Jr., Troy, all of Mich., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 24, 2000, Appl. No. 645,094

Int. Cl. B32B *27/30;27/36;27/40*

U.S. Cl. 428—423.1 **28 Claims**

1. A low gloss crosslinkable coating composition that produces a low gloss coating upon cure comprising:

(a) a binder component which comprises a combination of at least two partially compatible crosslinkable components retained in an evaporable medium, whereby said low gloss coating exhibits a 60° specular gloss that is at least 5% lower than gloss of coatings from coating compositions containing any one of said crosslinkable components, and

wherein the first of said crosslinkable components in said combination is:

(v) a polar polymer selected from the group consisting of a polar acrylic polymer having at least two crosslinkable functionalities, a polar polyester having at least two crosslinkable functionalities, polar polyurethane having at least two crosslinkable functionalities and a combination thereof; and

wherein second of said crosslinkable components in said combination is:

(vi) a non-polar silane polymer, non-polar acrylic polymer having at least two crosslinkable functionalities, non-polar polyester having at least two crosslinkable functionalities, non-polar polyurethane having at least two crosslinkable functionalities or a combination thereof; and

(b) a crosslinking agent selected from the group consisting of monomeric melamine, polymeric melamine, polyisocyanate, and blocked polyisocyanate.

US 6,410,148 B1
SILICON BASED SUBSTRATE WITH ENVIRONMENTAL/THERMAL BARRIER LAYER

Harry Edwin Eaton, Jr., Woodstock; William Patrick Allen, Portland, both of Conn.; Nathan S. Jacobson, Westlake, Ohio; Nanottam P. Bansal, North Olmsted, Ohio; Elizabeth J. Opila, Lakewood, Ohio; James L. Smialek, Strongsville, Ohio; Kang N. Lee, Westlake, Ohio; Irene T. Spitsberg, Loveland, Ohio; Hongyu Wang; Peter Joel Meschter, both of Niskayuna, N.Y., and Krishan Lal Luthra, Schenectady, N.Y., assignors to General Electric Co., New York; United Technologies Corp., Del., and The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 15, 1999, Appl. No. 292,349

Int. Cl. B32B *9/00;9/04*

U.S. Cl. 428—446 **53 Claims**

1. An article comprising:

a substrate comprising silicon; and

a gaseous species of Si formation inhibiting barrier layer, wherein the barrier layer is selected from the group consisting of (a) barium oxide, (b) barium aluminosilicate, (c) barium strontium aluminosilicate, (d) from about 0.00 to 1.00 moles BaO, from about 0.00 to 1.00 mole SrO, about 1.0 mole Al_2O_3 and about 2.00 mole SiO_2 wherein the total of BaO and SrO is about 1.00 mole and (e) from about 0.00 to 1.00 mole BaO, from about 0.00 to 1.00 mole of an oxide of a second alkaline earth metal, about 1.00 mole Al_2O_3 and about 2.00 mole SiO_2, wherein BaO plus the other alkaline earth metal oxide total 1 mole wherein the barrier layer has a crystallographic structure which is at least 50% by volume celsian and inhibits the formation of a gaseous species of Si when the article is exposed to a high temperature, aqueous environment.

US 6,410,149 B1
SILANE-BASED NANOPOROUS SILICA THIN FILMS AND PRECURSORS FOR MAKING SAME

Neil Hendricks, Sonora, Calif.; Douglas M. Smith, Albuquerque, N. Mex.; Teresa Ramos, Albuquerque, N. Mex.; Stephen Wallace, Albuquerque, N. Mex., and James Drage, Fremont, Calif., assignors to AlliedSignal Inc., Morristown, N.J.

Provisional application No. 60/098,068, filed on Aug. 27, 1998. This application Aug. 23, 1999, Appl. No. 378,705.

Int. Cl. B23B *9/04;* **H01L** *21/31;* **B05D** *3/02;1/02;1/18*

U.S. Cl. 428—447 **24 Claims**

1. A nanoporous dielectric film on a substrate prepared by a process comprising:

a) combining at least one mono-, di-, or tri-functional precursor with at least one tetrafunctional precursor in a reaction mixture to form a nanoporous film precursor:

b) recovering the nanoporous film precursor of (a) from said reaction mixture and depositing the same onto a suitable substrate, and

c) gelling said deposited film to form a nanoporous dielectric coating on said substrate;

wherein said mono-, di-, or tri-functional precursor has a number of functional leaving groups ranging from 1 to 3; and wherein said mono, di-, or tri-functional precursor is an alkoxysilane having the formula:

$$A_n\text{-}SiH_m \qquad \text{(Formula 1)}$$

wherein each A is independently all alkoxy (O—R) and R is an organic moiety independently selected from the group consisting of an alkyl and an aryl, and wherein n is an integer ranging from 1 to 3; m is an integer ranging from 1 to 3 and the sum of m and n is 4; or wherein the mono-, di-, or tri-functional precursor is an acetoxy (CH3—CO—O—) such as an acetoxy-silane compound and/or a halogenated compound such as a halogenated silane compound and/or combinations thereof; and wherein the recovered nanoporous film precursor is deposited onto said substrate by a

method selected from the group consisting of spin deposition, dip-coating, spray deposition and combinations thereof.

US 6,410,150 B1

COMPOSITION FOR FILM FORMATION, METHOD OF FILM FORMATION, AND INSULATING FILM

Takahiko Kurosawa, Goleta, Calif.; Eiji Hayashi; Seo Youngsoon, both of Ibaraki, Japan; Keiji Konno, Mie, Japan; Atsushi Shiota, and Kinji Yamada, both of Ibaraki, Japan, assignors to JSR Corporation, Tokyo, Japan

Filed Sep. 27, 2000, Appl. No. 669,859

Claims priority, application Japan, Sep. 29, 1999, 11-275553

Int. Cl. B32B *9/04*

U.S. Cl. 428—447 **10 Claims**

1. A composition for film formation which comprises

(A) a product of hydrolysis and condensation obtained by hydrolyzing and condensing, in the presence of an alkali catalyst, at least one silane compound selected from the group consisting of compounds represented by the following formula (1), compounds represented by the following formula (2), and compounds represented by the following formula (3), and

(B) a product of hydrolysis and condensation obtained by hydrolyzing and condensing, in the presence of an acid catalyst, at least one silane compound selected from the group consisting of compounds represented by the following formula (1), compounds represented by the following formula (2), and compounds represented by the following formula (3):

$$R_aSi(OR^1)_{4-a} \quad (1)$$

wherein R represents hydrogen atom, fluorine atom, or a monovalent organic group; R^1 represents a monovalent organic group; and a is an integer of 1 or 2;

$$Si(OR^2)_4 \quad (2)$$

wherein R^2 represents a monovalent organic group;

$$R^3_b(R^4O)_{3-b}Si—(R^7)_d—Si(OR^5)_{3-c}R^6_c \quad (3)$$

wherein R^3 to R^6 may be the same or different and each represent a monovalent organic group; b and c may be the same or different and each are an integer of 0 to 2; R^7 represents oxygen atom, a phenylene group, or a group represented by $—(CH_2)_n—$, wherein n is an integer of 1 to 6; and d is 0 or 1.

US 6,410,151 B1

COMPOSITION FOR FILM FORMATION, METHOD OF FILM FORMATION, AND INSULATING FILM

Takahiko Kurosawa, Goleta, Calif.; Eiji Hayashi, Ibaraki, Japan; Seo Youngsoon, Ibaraki, Japan; Atsushi Shiota, Ibaraki, Japan, and Kinji Yamada, Ibaraki, Japan, assignors to JSR Corporation, and Kabushiki Kaisha Toshiba, both of Tokyo, Japan

Filed Sep. 27, 2000, Appl. No. 670,547

Claims priority, application Japan, Sep. 29, 1999, 11-275554

Int. Cl. B32B *9/04*

U.S. Cl. 428—447 **8 Claims**

1. A composition for film formation which comprises

(A) a product of hydrolysis and condensation obtained by hydrolyzing and condensing, in the presence of an alkali catalyst, at least one silane compound selected from the group consisting of compounds represented by the following formula (1), compounds represented by the following formula (2), and compounds represented by the following formula (3) and

(B) a product of hydrolysis and condensation obtained by hydrolyzing and condensing, in the presence of a metal chelate compound catalyst, at least one silane compound selected from the group consisting of compounds represented by the following formula (1), compounds represented by the following formula (2), and compounds represented by the following formula (3):

$$R_aSi(OR^1)_{4-a} \quad (1)$$

wherein R represents hydrogen atom, fluorine atom, or a monovalent organic group; R^1 represents a monovalent organic group; and a is an integer of 1 or 2;

$$Si(OR^2)_4 \quad (2)$$

wherein R^2 represents a monovalent organic group;

$$R^3_b(R^4O)_{3-b}Si—(R^7)_d—Si(OR^5)_{3-c}R^6_c \quad (3)$$

wherein R^3 to R^6 may be the same or different and each represent a monovalent organic group; b and c may be the same or different and each are an integer of 0 to 2; R^7 represents oxygen atom, a phenylene group, or a group represented by $—(CH_2)_n—$, wherein n is an integer of 1 to 6; and d is 0 or 1.

US 6,410,152 B2

CHEMICALLY ADSORBED FILM AND METHOD OF MANUFACTURING THE SAME

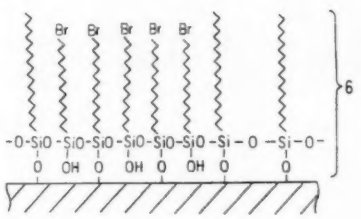
Tadashi Ohtake, Neyagawa; Norihisa Mino, Settu, and Kazufumi Ogawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial., Co., Ltd., Osaka, Japan

Division of application No. 08/306,517, filed on Sep. 15, 1994, now Pat. No. 6,277,444, which is a continuation of application No. 08/021,120, filed on Feb. 23, 1993, now abandoned. This application Jun. 28, 2001, Appl. No. 892,530.

Claims priority, application Japan, Mar. 2, 1992, 4-044289

Int. Cl. B32B *9/04*

U.S. Cl. 428—447 **5 Claims**



1. A chemically adsorbed film comprising stem molecules and graft molecules, wherein said film is applied to a substrate surface comprising active hydrogens or an alkali metal, wherein stem molecules are directly or indirectly covalently bonded to said substrate surface using at least one element chosen from the group consisting of Si, GE, Sn, Ti, Zr, S or C, and wherein graft molecules are covalently bonded to at least one element chosen from the group consisting of Si, Ge, Sn, Ti, Zr, S or C using at least one bond chosen from the group consisting of —SiO—, —GeO—, —SnO—, —SnN—, —TiO—, —ZrO—, $—SO_2—$ and —C—.

US 6,410,153 B1

NICKEL BASED SUPERALLOY

Robert W Broomfield, Bristol, and Colin N Jones, Nottingham, both of United Kingdom, assignors to Rolls-Royce plc, London, United Kingdom

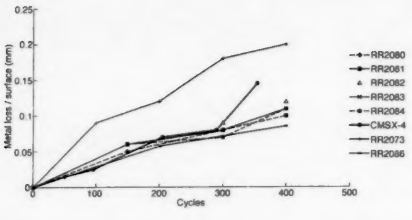
Filed Feb. 14, 2000, Appl. No. 504,034

Claims priority, application United Kingdom, Feb. 22, 1999, 9903988

Int. Cl. B32B *15/04;* **C22C** *19/05*

U.S. Cl. 428—469 **15 Claims**

1. A nickel based single crystal superalloy comprising 3–11 wt % cobalt, 4.7–5.7 wt % Chromium, 2.4–3.0 wt % molybdenum, 3.0–3.8 wt % tungsten, 3.0–3.8 wt % rhenium, 5.5–7.0 wt % aluminum, 5.0–6.0 wt % tantalum, 0.5–1.0 wt % niobium, 0–0.2



wt % hafnium, 0–150 ppm carbon, 0–100 ppm yttrium, 0–100 ppm lanthanum, 0–5 ppm sulfur and the balance nickel plus incidental impurities.

US 6,410,154 B2

TIAL-BASED ALLOYS WITH EXCELLENT OXIDATION RESISTANCE, AND METHOD FOR PRODUCING THE SAME

Hiroyuki Kawaura; Kazuaki Nishino, both of Seto, and Takashi Saito, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-gun, Japan

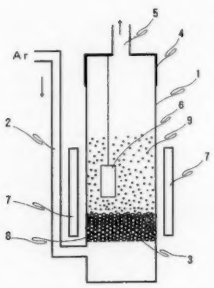
PCT No. PCT/JP97/01035, § 371 Date Nov. 28, 1997, § 102(e) Date Nov. 28, 1997, PCT Pub. No. WO97/37050, PCT Pub. Date Oct. 9, 1997

PCT Filed Mar. 26, 1997, Appl. No. 952,514

Claims priority, application Japan, Mar. 29, 1996, 8-103834; Mar. 29, 1996, 8-103835; Aug. 29, 1996, 8-248583

Int. Cl. B32B *9/00*

U.S. Cl. 428—472 **22 Claims**



1. A product comprising a substrate comprising a TiAl-base alloy; and a surface part formed on the substrate, said product produced by

introducing into a fluidized bed furnace a treating reagent consisting essentially of an oxide of at least one element selected from the group consisting of niobium (Nb), tantalum (Ta), chromium (Cr) and tungsten (W), and a powdery refractory;

introducing a fluidizing gas thereinto to fluidize the treating reagent;

disposing a TiAl-base alloy, which has an Al content of from 15 at. % to 55 at. % in the fluidized bed furnace; and

heating the TiAl-base alloy in an inert gas at a temperature of from 400° C. to 1450° C.

US 6,410,155 B2

TEMPERATURE SENSITIVE POLYMERS AND WATER-DISPERSIBLE PRODUCTS CONTAINING THE POLYMERS

Pavneet Singh Mumick; Yihua Chang, and James Hongxue Wang, all of Appleton, Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Division of application No. 09/386,615, filed on Aug. 31, 1999, now Pat. No. 6,277,768, which is a division of application No. 08/778,724, filed on Dec. 31, 1996, now Pat. No. 5,969,052. This application May 18, 2001, Appl. No. 860,788.

Int. Cl. B32B *27/06*

U.S. Cl. 428—474.7 **15 Claims**

1. A thermoformable article comprising a polymer containing at least one N-isopropyl acrylamide structural unit, said polymer produced by a continuous extrusion method, said method comprising:

forming an intermediate salt from a reaction mixture comprising polyacrylic acid and isopropylamine; and

conducting a condensation reaction to convert the salt to the polymer and water.

US 6,410,156 B1

OXYGEN SCAVENGING POLYAMIDE COMPOSITIONS SUITABLE FOR PET BOTTLE APPLICATIONS

Murali K. Akkapeddi, Morristown; Edward P. Socci, Stewartsville; Timothy J. Kraft, Pompton Plains; Darnell C. Worley, II, Phillipsburg; Jeffrey D. Pratt, Budd Lake, all of N.J., and Clark V. Brown, White Plains, N.Y., assignors to Honeywell International Inc., Morris Township, N.J.

Filed Mar. 6, 2001, Appl. No. 800,218

Int. Cl. B32B *27/08;* **B29C** *45/00*

U.S. Cl. 428—476.1 **18 Claims**

1. A multilayer article which comprises:

a) a polyamide composition layer comprising a slow crystallizing polyamide blend comprising (i) an amorphous, semiaromatic polyamide homopolymer, copolymer or mixture thereof and (ii) a semicrystalline, aliphatic polyamide homopolymer, copolymer or mixture thereof wherein in the weight ratio of (i):(ii) ranges from about 99:1 to about 30:70; at least one polyamide-compatible, oxidizable polydiene; and at least one oxidation promoting metal salt catalyst; and

b) a thermoplastic polymer layer on one or both sides of said polyamide composition layer.

US 6,410,157 B1

CASTING FILM FOR PRODUCING CERAMIC GREEN SHEET

Toru Nakamura, and Tomishi Shibano, both of Saitama, Japan, assignors to Lintec Corporation, Tokyo, Japan

Filed Jun. 19, 2001, Appl. No. 883,257

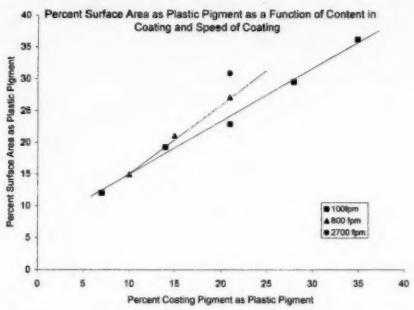
Claims priority, application Japan, Jul. 6, 2000, 2000-205642

Int. Cl. B32B *7/06;27/08;27/30;27/36;27/42*

U.S. Cl. 428—482 **7 Claims**

1. A casting film which is used for producing a ceramic green sheet and which comprises a substrate film and a releasing layer formed on at least either side thereof, wherein said releasing layer comprises a cured resin from (A) a stearic acid-modified alkyd resin and/or a stearic acid-modified acrylic resin and a (B) amino resin.

US 6,410,158 B1
HIGH GLOSS COATED PAPER
Dean R. Johnson, Columbia; Eric D. Johnson, Flintstone, both of Md., and James E. Shultz, Keyser, W. Va., assignors to Westvaco Corporation, Stamford, Conn.
Division of application No. 09/289,871, filed on Apr. 12, 1999, now Pat. No. 6,242,047. This application Feb. 21, 2001, Appl. No. 788,701.
Int. Cl. B32B *23/04;* **B05D** *3/12*
U.S. Cl. 428—532 **6 Claims**

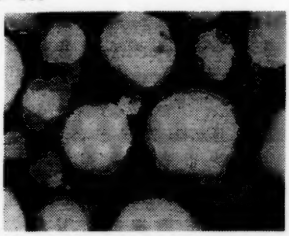

Percent Surface Area as Plastic Pigment as a Function of Content in Coating and Speed of Coating
Percent Surface Area as Plastic Pigment
Percent Costing Pigment as Plastic Pigment
100fpm
600 fpm
2700 fpm

1. A high gloss coated paper having applied to at least one surface thereof the dried residue of from about 6 to 18 lbs/ream (ream size 3300 sq. ft) of an aqueous coating formulation, said coating formulation comprising:

a pigment composition comprising, by weight as coating pigments, about 0–33% coating clay, 46–60% calcium carbonate, and from about 14–35% of a hollow sphere plastic pigment, wherein 100% of the pigment composition equals 100 parts weight, from about 10 to 12 parts by weight binder per 100 parts pigment composition, and water in an amount sufficient to provide a coating formulation with a solids content of from about 45 to 60%;

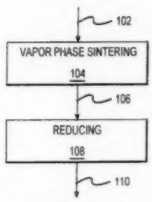
said coated paper exhibiting a 75 degree paper gloss of at least about 90, a 60 degree paper gloss of at least about 55, a 20 degree paper gloss of at least about 35, and a Parker Print Surf of from about 0.44 to 0.65; wherein the high gloss characteristics of the coated paper are provided by finishing, after the coating has been applied, by passing the coated paper through a plurality of nips in a supercalender device at a load of from about 1500 to 2000 pli, wherein at least one of the nips includes a heated roll having a surface temperature of from about 100–240 degrees F. in contact with the coated surface of the paper.

US 6,410,159 B1
SELF-BONDING MCRALY POWDER
Frank J. Hermanek, Indianapolis, Ind., assignor to Praxair S. T. Technology, Inc., North Haven, Conn.
Filed Oct. 29, 1999, Appl. No. 430,310
Int. Cl. B22F *1/00*
U.S. Cl. 428—570 **11 Claims**



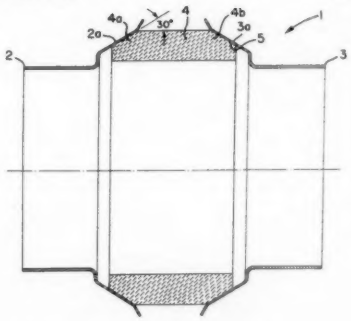
1. A gas seal, the gas seal including an abradable coating, the abradable coating having high temperature oxidation resistance and an abradable cohesive structure, the abradable cohesive structure containing interparticle welding of MCrAlY powder, the abradable cohesive structure formed from MCrAlY powder having an aluminum layer coating the MCrAlY powder and wherein M is selected from the group consisting of iron, nickel, cobalt, iron-base alloys, nickel-base alloys and cobalt-base alloys.

US 6,410,160 B1
POROUS METAL-CONTAINING MATERIALS, METHOD OF MANUFACTURE AND PRODUCTS INCORPORATING OR MADE FROM THE MATERIALS
Steven M. Landin, Colden; Dennis W. Readey, Lakewood, and Darin J. Aldrich, Westminster, all of Colo., assignors to Colorado School of Mines, Golden, Colo.
PCT No. PCT/US99/09727, § 371 Date Nov. 24, 1999, § 102(e) Date Nov. 24, 1999, PCT Pub. No. WO99/56899, PCT Pub. Date Nov. 11, 1999
Provisional application No. 60/084,050, filed on May 4, 1998. This PCT application May 4, 1999, Appl. No. 555,734.
Int. Cl. B22F *3/10*
U.S. Cl. 428—613 **48 Claims**



28. A porous metal-containing material produced by chemical reduction to metallic form of at least a portion of a porous vapor phase sintered metal oxide.

US 6,410,161 B1
METAL-CERAMIC JOINT ASSEMBLY
Jian Li, New Milford, Conn., assignor to FuelCell Energy, Inc., Danbury, Conn.
Filed Apr. 15, 1999, Appl. No. 292,440
Int. Cl. B21D *39/00*
U.S. Cl. 428—621 **22 Claims**



1. A metal-ceramic joint assembly comprising:

a metallic member formed from one of an aluminum-containing stainless steel, a high chromium-content ferritic stainless steel and an iron-nickel alloy with a corrosion protection coating, said metallic member including a conical outwardly tapered sleeve section;

a ceramic member spaced from said metallic member, said ceramic member including a conical inwardly tapered region situated within said conical outwardly tapered sleeve section

of said metallic member, the region between said conical outwardly tapered sleeve section of said metallic member and the conical inwardly tapered region of said ceramic member defining a space; and

a brazing alloy situated in said space, said brazing alloy being one of a Au-based and Ni-based alloy and having a brazing temperature in the range of 950 to 1200° C.

US 6,410,162 B1

ZINC OXIDE FILMS CONTAINING P-TYPE DOPANT AND PROCESS FOR PREPARING SAME

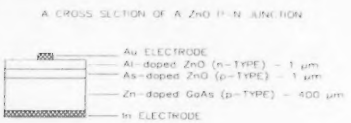
Henry W. White, Columbia, Mo.; Shen Zhu, Huntsville, Ala., and Yungryel Ryu, Columbia, Mo., assignors to The Curators of the University of Missouri, Columbia, Mo.

Continuation-in-part of application No. 09/128,516, filed on Aug. 3, 1998, now Pat. No. 6,291,085. This application Jul. 30, 1999, Appl. No. 364,809.

This patent is subject to a terminal disclaimer.

Int. Cl. B32B *15/01*

U.S. Cl. 428—642 **25 Claims**


A CROSS SECTION OF A ZnO P-N JUNCTION
Au ELECTRODE
Al-doped ZnO (n-TYPE) ~ 1 μm
As-doped ZnO (p-TYPE) ~ 1 μm
Zn-doped GaAs (p-TYPE) ~ 400 μm
In ELECTRODE

1. A ZnO film on a substrate, the ZnO film containing a p-type dopant and having a net acceptor concentration of at least about 10^{15} acceptors/cm^3, a resistivity no greater than about 1 ohm-cm, and a Hall Mobility of between about 0.1 and about 50 cm^2/Vs.

US 6,410,163 B1

HIGH STRENGTH THIN STEEL SHEET, HIGH STRENGTH ALLOYED HOT-DIP ZINC-COATED STEEL SHEET, AND METHOD FOR PRODUCING THEM

Yoshitsugu Suzuki; Kazunori Osawa; Chiaki Kato; Yoichi Tobiyama; Kei Sakata, all of Okayama; Osamu Furukimi, Chiba, and Akio Shinohara, Okayama, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

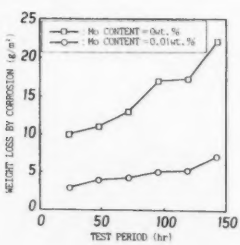
PCT No. PCT/JP99/04385, § 371 Date May 30, 2000, § 102(e) Date May 30, 2000, PCT Pub. No. WO00/18976, PCT Pub. Date Apr. 6, 2000

PCT Filed Aug. 13, 1999, Appl. No. 555,339

Claims priority, application Japan, Sep. 29, 1998, 10-276034; Nov. 20, 1998, 10-331767

Int. Cl. B32B *15/01;* **C21D** *8/02*

U.S. Cl. 428—659 **21 Claims**



21. A high strength galvannealed steel sheet excellent in workability, coating adhesion and corrosion resistance obtained by hot-dip galvanizing a steel sheet containing up to 1.00 wt. % Mo and galvannealing the same, wherein the galvannealing layer has an Fe content within a range of from 8 to 11 wt. % and an Mo content within a range of from 0.002 to 0.11 wt. %.

US 6,410,164 B1

ANTIFOULING MEMBER AND PROCESS FOR PRODUCING THE SAME

Teruki Takayasu, Nara, Japan, assignor to Showa Co., Ltd., Nara, Japan

PCT No. PCT/JP98/03512, § 371 Date Sep. 12, 2000, § 102(e) Date Sep. 12, 2000, PCT Pub. No. WO99/65675, PCT Pub. Date Dec. 23, 1999

PCT Filed Aug. 6, 1998, Appl. No. 623,990

Claims priority, application Japan, Jun. 17, 1998, 10-185720

Int. Cl. B32B *15/01*

U.S. Cl. 428—660 **15 Claims**

1. A marine organism deposition-preventing material comprising a corrosion resistant metal substrate comprising titanium, zirconium, tantalum, niobium or an alloy thereof, and a coating layer of silver or silver alloy bonded to said corrosion resistant metal substrate having a bonding strength of 0.2 MPa or more.

US 6,410,165 B1

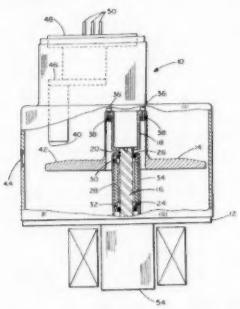
CRACK RESISTANT WELD

John Warren, Waukesha; Paul Neitzke, Menomonee Falls, and Craig Higgins, Milwaukee, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Division of application No. 09/352,393, filed on Jul. 13, 1999, now Pat. No. 6,335,512. This application Nov. 28, 2000, Appl. No. 723,940.

Int. Cl. B23K *35/22;9/00;* **B32B** *15/18*

U.S. Cl. 428—680 **36 Claims**



1. A crack resistant, ductile weld formed by the method comprising the steps of:

a. incorporating commercially pure nickel into a joint formed between at least two dissimilar metallic alloys, wherein at least one of the metallic alloys is a high carbon, powder metallurgical, cobalt free tool steel that contains greater than 1 wt. % of carbon and total refractory metal additions greater than 15 wt. %; and thereafter

b. welding the nickel filled joint.

US 6,410,166 B1

ORGANIC ELECTROLUMINESCENCE DEVICE DOPING DEVICE AND ORGANIC ELECTROLUMINESCENCE DEVICE

Hisamitsu Takahashi; Yoshihisa Tsuruoka; Satoshi Tanaka, and Toshio Miyauchi, all of Mobara, Japan, assignors to Futaba Corporation, Mobara, Japan

Filed Aug. 20, 1997, Appl. No. 915,080

Claims priority, application Japan, Aug. 29, 1996, 8-228769

Int. Cl. H05B *33/14*

U.S. Cl. 428—690 **47 Claims**

1. An organic electroluminescence device, comprising:

a luminous layer positioned between a pair of electrodes, at least one of which electrodes is translucent, wherein electrons and holes are implanted into said organic luminous layer so as to

cause rejoinder of said electrons and holes which results in the generation of excitons, extinction of which produces light emission which is utilized via said translucent electrode,

said organic luminous layer being doped with a metal chelate complex whose ligand has a nuclear structure of N,N'-bissalicylidene-2,3-diaminobenzofuran (SABF).

US 6,410,167 B2

ORGANIC ELECTROLUMINESCENT DEVICE

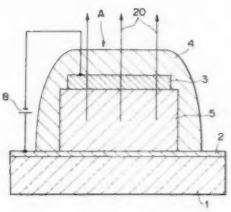
Tadashi Ishibashi; Mari Ichimura, and Shinichiro Tamura, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 17, 1999, Appl. No. 312,764

Claims priority, application Japan, May 18, 1998, 10-134135

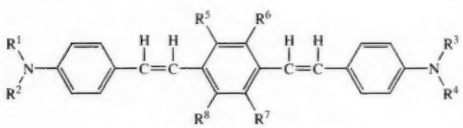
Int. Cl. B32B *15/08*

U.S. Cl. 428—690 **8 Claims**



1. An organic electroluminescent device comprising an organic layer having a luminescent region provided between an anode and a cathode, wherein said organic layer comprises, as an organic luminescent material, a distyryl compound of formula (1):

(1)

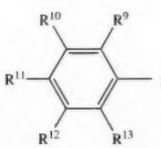


wherein

R^1 and R^4 are unsubstituted phenyl;

R^2 and R^3 are each independently a group of formula (2):

(2)



R^9, R^{10}, R^{11}, R^{12} and R^{13} are independently selected from the group consisting of hydrogen, C_2–C_{24} alkoxyl, and alkyl, wherein at least one of R^9, R^{10}, R^{11}, R^{12} and R^{13} is an alkoxyl or alkyl, and provided R^{11} is C_3–C_{24} alkoxyl when R^2 and R^3 are the same, and R^9, R^{10}, R^{12}, and R^{13} are hydrogen; and

R^5, R^6, R^7 and R^8 are independently selected from the group consisting of hydrogen, cyano, nitro, and halogen, wherein at least one of R^5, R^6, R^7 and R^8 is cyano, nitro, or halogen.

US 6,410,168 B1

ORGANIC ELECTROLUMINESCENCE ELEMENT

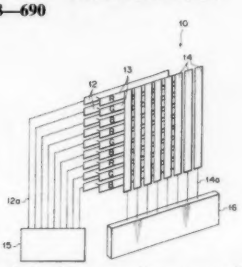
Shinichiro Tamura, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 14, 1999, Appl. No. 352,751

Claims priority, application Japan, Jul. 21, 1998, 10-205516

Int. Cl. H05B *33/00*

U.S. Cl. 428—690 **10 Claims**



1. An organic luminescence element comprising:

a first electrode layer;

an organic electroluminescence layer formed adjacent to one surface of said first electrode layer;

a second electrode layer formed adjacent to the other surface of said organic luminescence layer, said second electrode layer having an optical reflectance to visible light specified in a range of 50% or less;

a low optical reflection layer formed on said second electrode layer on the opposed side to said surface adjacent to said organic electroluminescence layer, said low optical reflection layer comprising at least one or more layers including a layer having an optical reflectance to visible light specified in a rang of 10% or less; and

a conductive layer provided between said second electrode layer and said low optical reflection layer, said conductive layer constituting an electrode portion in combination with said second electrode layer.

US 6,410,169 B1

DISCHARGE LAMP

Thomas Justel; Herbert F. Borner; Hans Nikol, all of Aachen, and Wolfgang Busselt, Roetgen, all of Germany, assignors to Koninklijke Philips Electronics N.V., Netherlands

Filed Nov. 17, 1999, Appl. No. 442,752

Claims priority, application European Pat. Off., Nov. 26, 1998, 98203996

Int. Cl. H05B *33/14*; **H01J** *61/00*

U.S. Cl. 428—690 **8 Claims**

1. Discharged lamp equipped with

a gastight lamp vessel transparent for visible radiation filled with at least one gas and mercury for generating ultraviolet radiation during operation of the discharge lamp, and

a luminescent screen comprising an organic Eu^{3+} coordination compound configured to convert ultraviolet radiation having a wavelength between 350 nm and 450 nm into red light.

US 6,410,170 B1

HIGH RESISTIVITY FEXN SPUTTERED FILMS FOR MAGNETIC STORAGE DEVICES AND METHOD OF FABRICATION

Yingjian Chen, Fremont, and Chester Qian, San Jose, both of Calif., assignors to Read-Rite Corporation, Fremont, Calif.

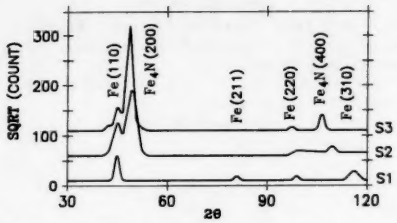
Filed May 20, 1999, Appl. No. 315,863

Int. Cl. G11B *5/66*

U.S. Cl. 428—692 **24 Claims**

1. A method for fabricating a magnetic thin film comprising:

a) depositing Fe by sputtering using N_2 to form a thin film comprising α-Fe and γ-Fe_4N having relative percentages; and



b) controlling deposition characteristics to increase the relative percentage of γ-Fe_4N to α-Fe to provide expanded lattice constants for both the α-Fe and the γ-Fe_4N.

US 6,410,171 B1

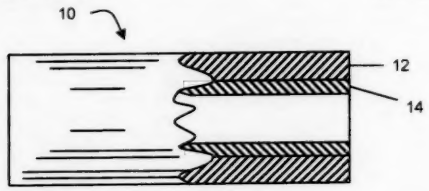
PROTECTING METAL FROM CARBON

Thomas E. Paulson, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Aug. 31, 2000, Appl. No. 652,078

Int. Cl. B32B *9/00*

U.S. Cl. 428—697 **23 Claims**



1. A composite article comprising a metal substrate and a continuous, adherent, glass-ceramic coating on the surface of the metal substrate to insulate the article against an adverse effect of carbon on that surface, the glass-ceramic comprising at least two crystal phases, one phase being leucite and a second phase having a lower CTE than leucite over the range of 25– 800° C.

US 6,410,172 B1

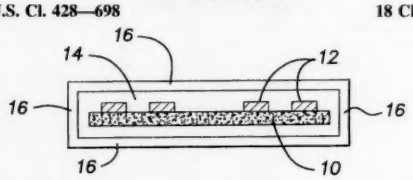
ARTICLES COATED WITH ALUMINUM NITRIDE BY CHEMICAL VAPOR DEPOSITION

Michael H. Gilbert, Sr., North Olmsted, Ohio, assignor to Advanced Ceramics Corporation, Lakewood, Ohio

Provisional application No. 60/166,971, filed on Nov. 23, 1999. This application Nov. 21, 2000, Appl. No. 717,546.

Int. Cl. B32B *9/00*

U.S. Cl. 428—698 **18 Claims**



1. An article comprising a body, said body comprising a substrate and a pyrolytic graphite element mounted contiguously to the substrate, the article further comprising an insulating layer of boron nitride overlaying the substrate and the pyrolytic graphite element, the article further comprising an outer coating of aluminum nitride provided by chemical vapor deposition adjacent the body, the article being selected from the group consisting of a heating element, an electrostatic chuck, and a wafer carrier, the outer coating being effective to protect the article against attack by a cleaning composition.

US 6,410,173 B1

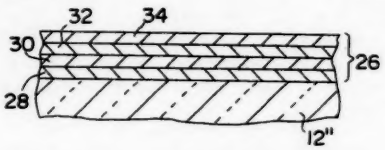
ANTIREFLECTION COATINGS AND OTHER MULTILAYER OPTICAL COATINGS FOR HEAT-TREATABLE INORGANIC SUBSTRATES AND METHODS FOR MAKING SAME

Nanning J. Arfsten; Axel Reich, both of Moorestown; Frank Rodriguez, Maple Shade, and James F. Gavlas, Mercerville, all of N.J., assignors to Denglas Technologies, LLC, Moorestown, N.J.

Filed Nov. 30, 1998, Appl. No. 201,599

Int. Cl. B32B *9/00*

U.S. Cl. 428—701 **16 Claims**



1. A sol-gel derived multilayer antireflection coating for use in coating a heat treatable inorganic substrate comprising:

(a) an inner layer for contact with an inorganic substrate having at least two different metallic oxides and which provides an index of refraction of from about 1.54 to about 1.90 after curing;

(b) a middle layer on the inner layer comprising an oxide of zirconium and which provides an index of refraction of at least about 1.90 after curing; and

(c) an outer layer on the middle layer comprising at least one metallic oxide and which provides an index of refraction of about 1.54 or less after curing and wherein optical properties of the sol-gel derived multilayer antireflection coating are substantially retained after the multilayer antireflection coating is applied to an inorganic substrate and subsequently subjected to a heat treatment.

US 6,410,174 B1

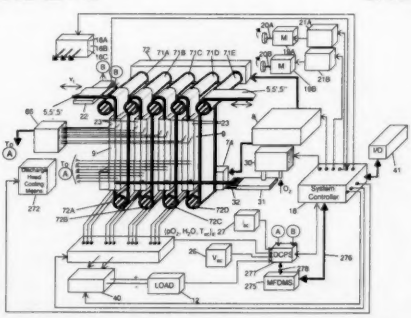
METAL-AIR FUEL CELL BATTERY SYSTEM HAVING MEANS FOR BI-DIRECTIONALLY TRANSPORTING METAL-FUEL TAPE AND MANAGING METAL-FUEL AVAILABLE THEREALONG

Sadeg M. Faris, Pleasantville, N.Y., assignor to Reveo, Inc., Elmsford, N.Y.

Continuation of application No. 09/116,643, filed on Jul. 16, 1998, and a continuation of application No. 09/110,761, filed on Jul. 3, 1998, and a continuation of application No. 09/110,762, filed on Jul. 3, 1998, and a continuation of application No. 09/074,337, filed on May 7, 1998, and a continuation of application No. 08/944,507, filed on Oct. 6, 1997. This application Jul. 22, 1998, Appl. No. 120,583.

Int. Cl. H01M *12/06;8/04*

U.S. Cl. 429—13 **24 Claims**



1. A metal-air fuel cell battery system having a discharging mode of operation, comprising:

a supply of metal-fuel tape wound on a supply spindle and taken up on a take-up spindle, and having a plurality of zones predefined along the length of said metal-fuel tape, each zone representing at least a portion of the metal-fuel tape for having association with metal-fuel availability information;

power supply terminals for delivering to an electrical load electrical power generated from said supply of metal-fuel tape at a specified output voltage;

a discharging head assembly for producing electrical power from said supply of metal-fuel tape as said metal-fuel tape is transported through said discharging head assembly during said discharging mode of operation;

a bi-directional tape transport mechanism for transporting said metal-fuel tape through said discharging head assembly at a selected speed and direction relative to said discharging head assembly;

a metal-fuel determination mechanism for determining the availability of metal-fuel along said zones of metal-fuel tape during said discharging mode of operation; and

a programmed controller for controlling said bi-directional tape transport mechanism in response to said fuel determination mechanism.

US 6,410,175 B1

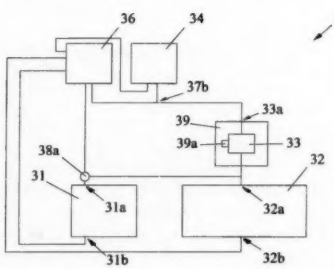
FUEL CELL SYSTEM WITH IMPROVED STARTING CAPABILITY

Werner Tillmetz, Lindau, Germany; David P. Wilkinson; Kevin M. Colbow, both of North Vancouver, Canada, and Jean St.-Pierre, Vancouver, Canada, assignors to Ballard Power Systems Inc., Burnaby, Canada

Filed Nov. 12, 1998, Appl. No. 191,049

Int. Cl. H01M *08/00*

U.S. Cl. 429—13 **38 Claims**



1. A method of commencing operation of a fuel cell system, said system comprising a plurality of solid polymer fuel cells, a supply of fuel, and a fuel processing subsystem comprising a reformer which processes a feedstock comprising said fuel to produce a hydrogen-containing gas stream, said method comprising:

directing a starting fluid stream comprising said fuel to at least a first portion of said plurality of solid polymer fuel cells during a start-up period, whereby said first portion provides output power during said start-up period; and

directing said hydrogen-containing gas stream from said fuel processing subsystem to at least a second portion of said plurality of solid polymer fuel cells after said start-up period, whereby said second portion provides output power after said start-up period.

US 6,410,176 B1

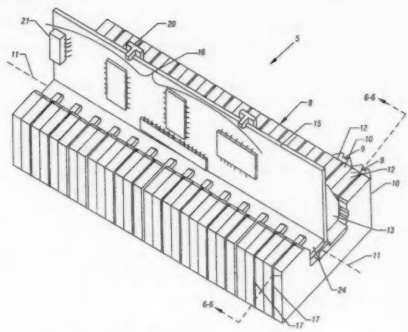
VOLTAGE MONITORING SYSTEM FOR A FUEL CELL STACK

Suat Genc, Troy; Larry A. Pitts, Averill Park; Kevin L. Mease, Latham; Charles M. Carlstrom, Saratoga Springs, all of N.Y., and Russel H. Marvin, Goshen, Conn., assignors to Plug Power, Inc., Latham, N.Y.

Filed Jul. 31, 2000, Appl. No. 629,548

Int. Cl. H01M *8/00*

U.S. Cl. 429—13 **50 Claims**



1. An assembly comprising:

a fuel cell stack to provide cell voltages;

a substrate supporting electrical contacts;

an electrical bridge to provide indications of the cell voltages to the electrical contacts; and

a clamp to hold the electrical bridge in compression against the fuel cell stack to communicate indications of the cell voltages to the electrical contacts.

US 6,410,177 B1

FUEL CELL HAVING GAS MANIFOLD

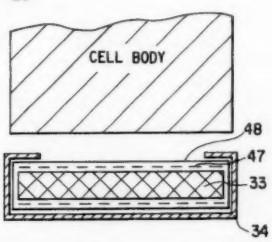
Kotaro Iyasu, Fuchu; Yoshitsugu Gocho, Fujisawa; Yoshihiro Moriyama; Akio Kano, both of Yokohama, all of Japan, and Kazuhisa Tanaka, Newington, Conn., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of application No. PCT/JP98/04873, filed on Oct. 28, 1998. This application Apr. 28, 2000, Appl. No. 559,911.

Claims priority, application Japan, Oct. 28, 1997, 9-295519

Int. Cl. H01M *8/04;8/12;2/00;2/02*

U.S. Cl. 429—26 **9 Claims**



5. A fuel cell comprising gas manifolds disposed on side surfaces of a cell stack, wherein each of said gas manifolds comprises:

plate-like heat insulating structures disposed on the side surfaces of said cell stack to oppose each other and corner members disposed in corners of said cell stack,

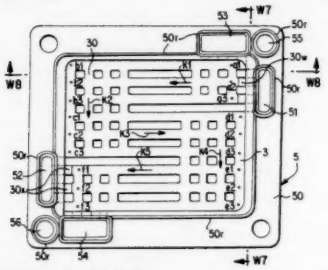
wherein said heat insulating structure comprises an internal sheet member and an external heat insulating member which oppose said cell stack, said heat insulating member is constituted by inserting a heat insulating material into a heat insulating-material holding frame, and two sides of said heat

insulating material are reinforced by first reinforcing members and surfaces of said first reinforcing members are reinforced by second reinforcing members.

US 6,410,178 B1
SEPARATOR OF FUEL CELL AND METHOD FOR PRODUCING SAME

Masanori Matsukawa, Aichi, Japan, assignor to Aisin Takaoka Co., Ltd., Toyota, Japan

Filed May 5, 1999, Appl. No. 304,951
Claims priority, application Japan, May 8, 1998, 10-125569; May 8, 1998, 10-125572
Int. Cl. H01M *2/00;2/02;2/14*
U.S. Cl. 429—39 **15 Claims**

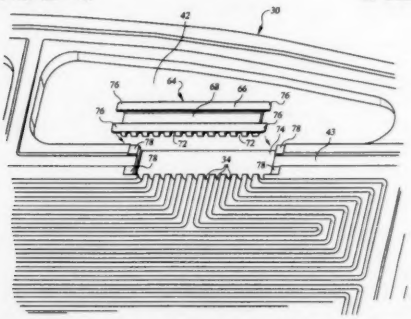


1. A separator of a fuel cell,
wherein said separator comprises a plate having a recessed gas path in which flows a gas containing an active material, and
wherein said gas path has a bottom surface in the plate possessing a surface roughness not larger than 1 μm in terms of Rz.

US 6,410,179 B1
FLUID FLOW PLATE HAVING A BRIDGE PIECE

Jeffrey R. Boyer, West Fulton; Franklin L. Canfield, Delmar, and Jeffrey L. Zemsky, Glenmont, all of N.Y., assignors to Plug Power Inc., Latham, N.Y.

Filed Apr. 19, 2000, Appl. No. 552,229
Int. Cl. H01M *8/04*
U.S. Cl. 429—39 **15 Claims**

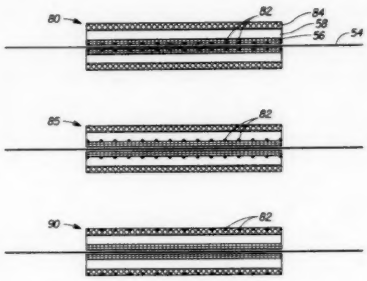


1. A fluid flow plate for a fuel cell, said fluid flow plate having a face and a fluid opening for receiving a fluid, said fluid flow plate comprising:
at least one flow channel in said face for distributing a fluid in said fuel cell;
a first groove defined within said face, said groove adapted to receive a sealing member; and
a bridge piece having a first surface, said first surface having a second groove defined therein, said second groove being adapted to receive said sealing member when the bridge piece is positioned on said face.

US 6,410,180 B1
FUEL CELL SYSTEM FOR LOW PRESSURE OPERATION

Alan J. Cisar, Cypress, Tex.; Dacong Weng, Rancho Palos Verdes, Calif., and Oliver J. Murphy, Bryan, Tex., assignors to Lynntech, Inc., College Station, Tex.

Continuation of application No. 08/926,547, filed on Sep. 10, 1997, now Pat. No. 6,054,228, which is a continuation-in-part of application No. 08/656,968, filed on Jun. 6, 1996, now Pat. No. 5,709,961. This application Mar. 13, 2000, Appl. No. 523,910.
Int. Cl. H01M *4/86*
U.S. Cl. 429—41 **70 Claims**



1. A low pressure gas electrode comprising:
(a) an electrically conducting and supporting substrate; wherein said substrate comprises at least two opposite faces; a plurality of openings allowing passage from one face to an opposite face, said openings encompassing between 10% and 90% of the total area of the substrate;
b) an electrically conductive porous material bound to the substrate comprised of an electrically conductive component and a binding component, wherein the electrically conductive component comprises an intimate mixture of a powder and loose fibers; and
(c) a catalyst layer bound to the electrically conductive porous material.

US 6,410,181 B1
HIGH TEMPERATURE LITHIUM OXYHALIDE ELECTROCHEMICAL CELL

David M. Spillman, Tonawanda, and Esther S. Takeuchi, East Amherst, both of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Provisional application No. 60/132,549, filed on May 5, 1999. This application May 2, 2000, Appl. No. 562,532.
Int. Cl. H01M *4/36;4/74*
U.S. Cl. 429—101 **27 Claims**

18. A method for providing an electrochemical cell, comprising the steps of:
a) expanding a nickel substrate in both a length-wise direction and a side-wise direction to form a nickel current collector;
b) providing an anode of an alkali metal contacted to the nickel current collector;
c) providing a cathode current collector in electrical association with the anode;
d) activating the anode and the cathode current collector with a catholyte comprising an organic solvent or inorganic depolarizer solvent.

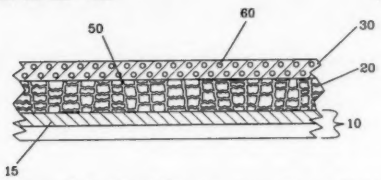
US 6,410,182 B1
METHOD OF MAKING SEPARATORS FOR ELECTROCHEMICAL CELLS COMPRISING A MICROPOROUS PSEUDO-BOEHMITE LAYER

Qicong Ying, Tucson, Ariz.; Steven A. Carlson, Cambridge, Mass., and Terje A. Skotheim, Tucson, Ariz., assignors to Moltech Corporation, Tucson, Ariz.

Division of application No. 09/215,029, filed on Dec. 17, 1998, now Pat. No. 6,194,098. This application Aug. 18, 2000, Appl. No. 641,539.

Int. Cl. H01M *2/14;2/16*

U.S. Cl. 429—129 **41 Claims**



1. A method of making a separator for an electric current producing cell, said separator comprising:

(i) at least one microporous pseudo-boehmite layer, in contact with

(ii) at least one protective coating layer comprising a polymer; wherein said method comprises the steps of:

(a) coating onto a substrate a first liquid mixture, A, comprising a boehmite sol, or alternatively, coating onto a substrate a first liquid mixture, B, comprising one or more polymers, monomers, or macromonomers, to form a first coating layer;

(b) drying the first coating layer formed in step (a) to form said microporous pseudo-boehmite layer, if said first liquid mixture A was utilized in step (a), or alternatively, drying the first coating layer formed in step (a) to form said protective coating layer, if said first liquid mixture B was utilized in step (a), to form a dried first coating layer;

(c) coating onto the layer formed in step (b) a second liquid mixture, B', comprising one or more polymers, monomers, or macromonomers to form a second coating layer, if said microporous pseudo-boehmite layer was formed in step (b), or alternatively, coating onto the layer formed in step (b) a second liquid mixture, A', comprising a boehmite sol, if said protective coating layer was formed in step (b), to form a second coating layer;

(d) drying the second coating layer formed in step (c) to form said protective coating layer, if said second liquid mixture B' was utilized in step (c), or alternatively, to form said microporous pseudo-boehmite layer, if said second liquid mixture A' was utilized in step (c), to form a dried second coating layer.

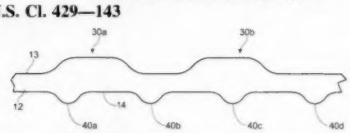
US 6,410,183 B2
BATTERY SEPARATOR WITH IMPROVED SHOULDERS

Daniel E. Weerts, 3908 Sedgewick Pl., SE., Albany, Oreg. 97321, and Gordon B. Dobbie, 1355 SW. Timian St., Corvallis, Oreg. 97333

Filed Apr. 16, 1999, Appl. No. 293,046

Int. Cl. H01M *2/16;2/18;2/14*

U.S. Cl. 429—143 **15 Claims**



1. A battery separator, comprising:

a backweb of porous, acid resistant material, the backweb having opposed first and second planar surfaces and first and second outer edges, the first planar surface having first and second shoulder areas adjacent the first and second edges, respectively, and a major rib area positioned between the first and second shoulder areas;

a plurality of major ribs extending outwardly from the first planar surface and confined within the major rib area;

first and second sets of multiple mini-ribs extending outwardly from the first planar surface and confined within the respective first and second shoulder areas, the mini-ribs in the first and second sets running in a direction generally along the respective first and second outer edges, and adjacent mini-ribs in each of the first and second sets being of uniform height and shape and spaced apart by a uniform distance;

each of the multiple mini-ribs in the first and second sets having a flat upper surface and a base joined by two sloping side walls, the upper surface bounded by curved opposite upper edges that merge with the sloping side walls and the base bounded by curved opposite lower edges that merge with the planar surface; and

multiple micro-ribs extending outwardly from the second planar surface of the backweb, the micro-ribs running in a direction along the width of the second planar surface and adjacent ones of the micro-ribs spaced apart by a uniform distance.

US 6,410,184 B1
POWER SOURCE CONTAINING RECHARGEABLE BATTERIES

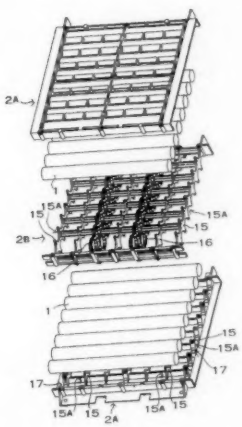
Tatsuhito Horiuchi, Sumoto, and Yoshiharu Takasaki, Ibi-Gun, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jan. 27, 2000, Appl. No. 492,184

Claims priority, application Japan, Jan. 28, 1999, 11-019619; Jan. 29, 1999, 11-022324; Jan. 29, 1999, 11-023201

Int. Cl. H01M *6/42;6/46;2/00;1/00;1/01;* **H02B** *1/00;1/01*

U.S. Cl. 429—156 **36 Claims**



1. A power source provided with a plurality of power modules, said power source comprising:

a holder case retaining said power modules in a parallel arrangement, said holder case comprising a first plastic cover having an inner side, a second plastic cover having an inner side, and a plastic intermediate member having opposite inner sides, said plastic intermediate member being located between said first plastic cover and said second plastic cover;

a plurality of holder ribs integrally formed on said inner side of said first plastic cover, said inner side of said second plastic cover, and said opposite inner sides of said plastic intermediate member, said holder ribs projecting so as to retain at least two of said power modules in a parallel arrangement, each of said holder ribs having an outer edge; and

a plurality of shock-absorbing gaskets attached to a corresponding number of said holder ribs, each of said shock-absorbing gaskets comprising an attachment groove extending along a length thereof,

wherein an outer edge of each of said corresponding number of said holder ribs is inserted into an attachment groove of one of said shock-absorbing gaskets, thereby attaching said shock-absorbing gaskets to said corresponding number of said holder ribs,

wherein said power modules are arranged in a plurality of rows, and

wherein at least one of said power modules is retained in a fixed position by said shock-absorbing gaskets that are attached to said holder ribs.

US 6,410,185 B1

BATTERY DEVICE FOR LOADING ON MOVING BODY

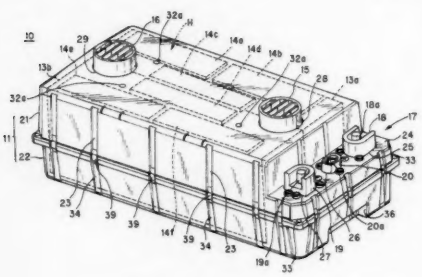
Hideya Takahashi, Fukushima; Ryoichi Yamane, and Yoshikazu Kanaishi, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 10, 2000, Appl. No. 501,308

Claims priority, application Japan, Feb. 15, 1999, 11-036331; Feb. 15, 1999, 11-036332; Jan. 26, 2000, 2000-021838; Jan. 26, 2000, 2000-021839

Int. Cl. H01M *2/02;2/06*

U.S. Cl. 429—163 **18 Claims**



1. A battery device for loading on a moving body comprising:

a modular casing having a battery housing section therein and at least two terminal openings;

an outer casing member for accommodating said modular casing in an inner housing spacing thereof; and

at least one secondary battery housed in said inner housing spacing so that terminal portions thereof are exposed to outside through said terminal openings;

said modular casing and/or said outer casing member being formed with a mounting portion for mounting the modular casing to said outer casing member so that a space portion is formed between an outer casing body and an inner modular casing body thereof facing each other, and

wherein said modular casing is combined from a first modular casing half and a second modular casing half each of which includes a battery housing half spatial section opened in one lateral side thereof and each having said terminal opening on the other lateral side thereof.

US 6,410,186 B1

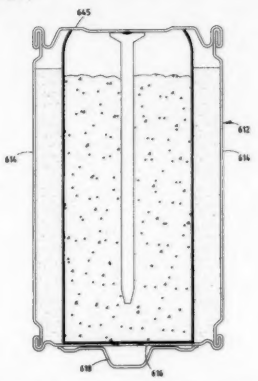
BATTERY CONSTRUCTION HAVING DOUBLE SEAM COVER CLOSURE

Gary R. Tucholski, Parma Heights, Ohio, and George R. Sondecker, Asheboro, N.C., assignors to Eveready Battery Company, Inc., St. Louis, Mo.

Provisional application No. 60/102,951, filed on Oct. 2, 1998, Provisional application No. 60/097,445, filed on Aug. 21, 1998. This application Apr. 16, 1999, Appl. No. 293,453.

Int. Cl. H01M *2/08;2/02*

U.S. Cl. 429—174 **51 Claims**



22. A hermetically sealed electrochemical cell comprising:

a can for containing electrochemically active materials including at least positive and negative electrodes and an electrolyte, said can having a first end, an open second end, side walls extending between said first and second ends, and an end wall extending across said first end, said can further having a flange that extends outward from said open second end of said can towards said first end;

a cover for sealing said open second end of said can, said cover having a peripheral edge that extends over and around said flange and is crimped between said flange and an exterior surface of said can; and

a sealant provided between said flange and said peripheral edge of said cover.

US 6,410,187 B1

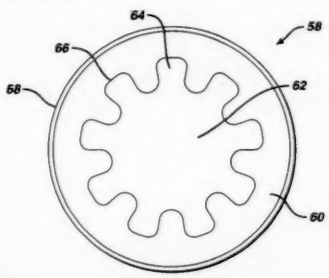
PRIMARY ALKALINE BATTERY

Weifang Luo, Norwood; Bhupendra K. Patel, Mansfield; Alexander B. Shelekhin, Acton; John D. Sillesky, Franklin; Viet H. Vu, Medway, and Douglas Woodnorth, Needham, all of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Sep. 9, 1999, Appl. No. 393,043

Int. Cl. H01M *4/06;6/06;6/08*

U.S. Cl. 429—206 **46 Claims**



1. A primary alkaline AA battery, comprising:

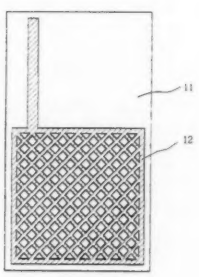
a housing;

a cathode within the housing;
an anode within the housing; and
a separator electrically separating the anode and the cathode;
wherein the battery has an $(S/V)^2$ value of greater than 0.38 mm^{-2}.

US 6,410,188 B1
NON-AQUEOUS ELECTROLYTE SECONDARY CELL
Takayuki Shirane; Yoshiaki Nitta; Shuji Tsutsumi; Masaki Hasegawa, all of Osaka, and Junichi Yamaura, Hyogo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
PCT No. PCT/JP99/06644, § 371 Date Sep. 11, 2000, § 102(e) Date Sep. 11, 2000, PCT Pub. No. WO00/33399, PCT Pub. Date Jun. 8, 2000
PCT Filed Nov. 29, 1999, Appl. No. 601,276
Claims priority, application Japan, Nov. 30, 1998, 10-338740; Oct. 5, 1999, 11-284387
Int. Cl. H01M *10/24*
U.S. Cl. 429—231.95 **4 Claims**

1. A non-aqueous electrolyte secondary battery comprising:
a positive electrode containing a lithium containing compound which intercalates and de-intercalates lithium; and
a negative electrode containing
i) a compound which has irreversible capacity of not less than 300 mAh/g at the initial charge and discharge, and
ii) lithium containing composite nitride represented by the general formula of $Li_{3-x}M_xN$.

US 6,410,189 B1
CURRENT COLLECTORS FOR BATTERY
Kazunori Yamada, Atsugi; Toshiaki Watanabe, Yugawara-machi; Shuhel Kubota, Fujieda, and Shizuo Sugawara, Tokyo, all of Japan, assignors to Tokai Aluminum Fiol Co., Ltd., Yokohama, Japan
Filed Dec. 23, 1999, Appl. No. 471,516
Claims priority, application Japan, Dec. 25, 1998, 10-368625; Jun. 1, 1999, 11-154194
Int. Cl. H01M *4/64;* **B23P** *13/00*
U.S. Cl. 429—233 **11 Claims**



1. A polymer rechargeable battery comprising:
a current collector for a positive electrode, said current collector being a metal-foil base material and having a number of throughholes formed by etching, wherein the remaining portion is not etched;
a current collector for a negative electrode, said current collector being a metal-foil base material and having a number of throughholes formed by etching, wherein the remaining portion is not etched;
a positive electrode material laminated on the current collector for a positive electrode;
a negative electrode material laminated on the current collector for a negative electrode; and
a separator made of a polymer containing an electrolyte solution, said separator being obtained by replacing a plastisizer contained in said polymer with an electrolyte solution, said separator being sandwiched by said positive electrode material and said negative electrode material.

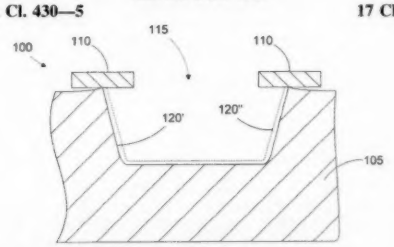
US 6,410,190 B1
PROCESS FOR THE PURIFICATION OF METHANIDE ELECTROLYTES
Nikolai Ignatiev, Duisburg; Peter Sartori, Rheinberg, and Peter Barthen, Duisburg, all of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Germany
Filed Apr. 28, 2000, Appl. No. 560,137
Claims priority, application Germany, Apr. 28, 1999, 199 19 346
Int. Cl. H01M *6/14*
U.S. Cl. 429—347 **20 Claims**

1. A process comprising:
reacting a starting methanide of formula (I)

$$MC(SO_2(C_xF_{2x+1}))_3 \quad (I)$$

in which
x is 1, 2, 3, 4, 5, 6, 7 or 8, and
M is H, Li, Na, K, Rb, Cs, $Mg_{1/2}$, $Ca_{1/2}$, $Sr_{1/2}$ or $Ba_{1/2}$,
with concentrated sulfuric acid to form a free acid of the methanide,
subjecting the free acid of the methanide to fractional rectification,
reacting the fractionally rectified free acid of the methanide with phosphorus pentoxide to form a reaction product, subjecting the reaction product to fractional rectification, and
reacting the fractionally rectified reaction product with metallic Li, Na, K, Rb, Cs, Mg, Ca, Sr, Ba, chlorides or hydrides thereof, or alkyllithium, in an aprotic solvent to form a corresponding high purity metal methanide of the formula (I) in a solution.

US 6,410,191 B1
PHASE-SHIFT PHOTOMASK FOR PATTERNING HIGH DENSITY FEATURES
John L. Nistler, Martindale, and Stuart E. Brown, Austin, both of Tex., assignors to Advanced Micro Devices, Inc., Austin, Tex.
Filed Jun. 25, 1999, Appl. No. 344,458
Int. Cl. G03F *9/00*
U.S. Cl. 430—5 **17 Claims**



1. A method for forming a photomask, comprising:
providing a transparent substrate;
forming an opaque layer over at least a first portion of the transparent substrate;
patterning the opaque layer to define a mask pattern and expose at least a second portion of the transparent substrate;
etching the second portion to define a phase shifting region having opposing edges, the edges defining line patterning features, and the distance between the opposing edges defining a critical dimension;

measuring the critical dimension;

comparing the measured critical dimension to a predetermined design dimension;

etching the phase shifting region based on the measured critical dimension and the predetermined design dimension to undercut the opaque layer and increase the distance between the opposing edges; and

removing at least a portion of the opaque layer proximate the edges.

US 6,410,192 B1

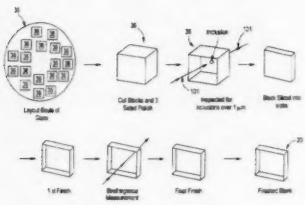
PHOTOLITHOGRAPHY METHOD, PHOTOLITHOGRAPHY MASK BLANKS, AND METHOD OF MAKING

Richard S. Priestley, Corning; Daniel R. Sempolinski, and Chunzhe C. Yu, both of Painted Post, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Provisional application No. 60/165,625, filed on Nov. 15, 1999. This application Dec. 9, 1999, Appl. No. 458,254.

Int. Cl. G03F *9/00*

U.S. Cl. 430—5 **31 Claims**



1. A photolithography method for producing patterns, said method comprising;

providing an illumination subsystem for producing and directing a <300 nm ultraviolet radiation λ,

providing a mask subsystem with a transmitting photolithography mask, said photolithography mask including a low birefringence fused silica SiO_2 glass wafer with photolithography pattern depictions, said SiO_2 glass wafer containing ≦0.1 ppm wt. F and having a glass birefringence≦2 nm/cm, measured at 632.8 nm,

providing a projection optics subsystem,

providing a radiation sensitive print subsystem, said print subsystem including a radiation sensitive print media,

aligning said illumination subsystem, said mask subsystem, said projection optics subsystem, and said radiation sensitive print subsystems and illuminating said photolithography mask with said ultraviolet radiation λ such that said photolithography pattern depictions of said low birefringence SiO_2 glass wafer mask with said SiO_2 glass containing ≦0.1 ppm wt. F are projected onto said radiation sensitive print media wherein polarization dispersions of ultraviolet radiation λ is inhibited.

US 6,410,193 B1

METHOD AND APPARATUS FOR A REFLECTIVE MASK THAT IS INSPECTED AT A FIRST WAVELENGTH AND EXPOSED DURING SEMICONDUCTOR MANUFACTURING AT A SECOND WAVELENGTH

Alan R. Stivers, San Jose, and Edita Tejnil, San Carlos, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

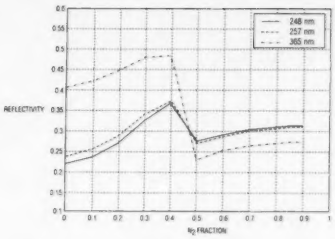
Filed Dec. 30, 1999, Appl. No. 474,857

Int. Cl. G03F *9/00;* **G06K** *9/100*

U.S. Cl. 430—5 **48 Claims**

1. An apparatus, comprising:

a reflective mask having non-reflective and reflective regions, said reflective regions reflective of light at an inspection wavelength and a semiconductor processing wavelength, said



non-reflective regions being less reflective of said first light and said second light than said reflective regions in order to create:

1) a first image with a contrast greater than 0.210 and that is formed by reflecting said first light off of said reflective mask: and

2) a second image with a contrast greater than 0.750 and that is formed by reflecting said second light off of said reflective mask.

US 6,410,194 B1

RESIST FILM FORMING METHOD AND RESIST COATING APPARATUS

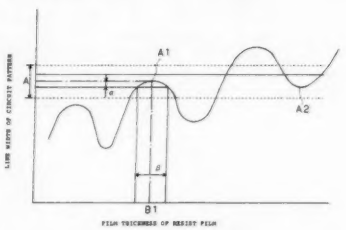
Kosuke Yoshihara, Kumamoto-Ken, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Feb. 3, 2000, Appl. No. 497,156

Claims priority, application Japan, Feb. 4, 1999, 11-027451

Int. Cl. G03F *7/00;* **B05D** *1/00*

U.S. Cl. 430—30 **5 Claims**



1. A method of forming a resist film on a substrate, comprising the steps of:

(a) determining a process condition for a resist film formation by means of a computer, including the steps of:

(i) inputting into the computer values of first parameters specifying the process condition and including a wavelength of a light used for exposing the resist film and a type of resist solution and a value of a line width of a circuit pattern,

(ii) determining via computer analysis a thickness value of the resist film to be formed on the substrate, based on a relationship expressing the line width of the circuit pattern as a function of the thickness of the resist film, the thickness value thus determined corresponding to an. extreme value of the function, the relationship being experimentally obtained beforehand and stored in the computer; and

(iii) determining via automatic computer analysis values of second parameters specifying the process condition together with the first parameters, wherein the thickness value determined in step (ii) can be obtained under the process condition specified by the values of the first and the second parameters; and

(b) forming a resist film on the substrate, by a resist film forming apparatus controlled by the computer, under the process condition specified by the values of the first and the second parameters.

US 6,410,195 B1

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER, PROCESS CARTRIDGE, AND ELECTROPHOTOGRAPHIC APPARATUS

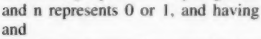
Takakazu Tanaka, Numazu, and Yuka Nakajima, Mishima, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 2000, Appl. No. 633,870
Claims priority, application Japan, Aug. 12, 1999, 11-228773
Int. Cl. G03G *5/05*
U.S. Cl. 430—56 **14 Claims**

1. An electrophotographic photosensitive member comprising a conductive support and a photosensitive layer provided thereon;

wherein said photosensitive layer contains a copolymerization product of:

(A) a monomer having a reactive group represented by the following Formula:

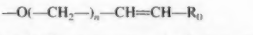


wherein R_0 represents a hydrogen atom or a methyl group, and n represents 0 or 1, and having a fumarate structure; and

(B) a charge-transporting material having a reactive group capable of reacting with the monomer.

9. An electrophotographic photosensitive member comprising a conductive support and a photosensitive layer provided thereon; wherein

said photosensitive layer contains a polymerization product of a monomer having a reactive group represented by the following Formula (1):



(1)

wherein R_0 represents a hydrogen atom or a methyl group, and n represents 0 or 1, provided that R_0 represents a methyl group when n is 0; and said monomer has a fumarate structure.

US 6,410,196 B1

PHOTORECEPTOR CHARGE TRANSPORT LAYER WITH A POLYCARBONATE BINDER

Kathleen M. Carmichael, Williamson, N.Y.; Stephan V. Drappel, Toronto, Canada; David J. Maty, Ontario, and John A. Bergfjord, Sr., Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 28, 2001, Appl. No. 682,623
Int. Cl. G03G *5/047*
U.S. Cl. 430—59.6 **17 Claims**

1. A charge transport layer material for a photoreceptor comprising at least a bisphenol A-phthallic acid dichloride ester copolymer polycarbonate binder and at least one charge transport material dispersed in a solvent comprised of at least tetrahydrofuran.

US 6,410,197 B1

METHODS FOR TREATING ALUMINUM SUBSTRATES AND PRODUCTS THEREOF

Mark Thomas Bellino, Loveland; Jennifer Kaye Neely, Arvada; Catherine Mailhé Randolph, Niwot, and Kasturi Rangan Srinivasan, Longmont, all of Colo., assignors to Lexmark International, Inc., Lexington, Ky.

Filed Sep. 18, 1998, Appl. No. 156,683
Int. Cl. G03G *5/047;5/10;* **B32B** *15/04*
U.S. Cl. 430—65 **8 Claims**

4. A photoconductor comprising a conductive aluminum substrate having an anodized surface layer of porous alumina and a sealing polymer which seals pores of the alumina surface layer, the sealing polymer comprising a phenoxy resin, an epoxy resin formed from epichlorohydrin and bisphenol A, or a pectin polymer, and a charge generation layer and a charge transport layer formed on the alumina surface layer, the charge generation layer comprising charge generation compound and a vinyl polymer or copolymer, wherein the charge transport layer is formed on the substrate and the charge generation layer is formed on the charge transport layer.

7. A photoconductor, comprising a conductive aluminum substrate having an anodized surface layer of porous alumina and a polymer which seals pores of the alumina surface layer, and a charge generation layer and a charge transport layer formed on the alumina surface layer, wherein the polymer comprises a pectin polymer.

US 6,410,198 B1

ZIRCONIUM COMPOUND AND ELECTROPHOTOGRAPHIC TONER EMPLOYING IT

Masataka Sawano; Taito Muraoka; Katuya Yamaguti; Rie Murakami, and Hiroyoshi Yamaga, all of Tsukuba, Japan, assignors to Hodogaya Chemical Co., Ltd., Kawasaki, Japan

PCT No. PCT/JP98/03953, § 371 Date May 4, 1999, § 102(e) Date May 4, 1999, PCT Pub. No. WO99/12941, PCT Pub. Date Mar. 18, 1999
PCT Filed Sep. 3, 1998, Appl. No. 297,568
Claims priority, application Japan, Sep. 5, 1997, 9-240763; Oct. 14, 1997, 9-280241
Int. Cl. G03G *9/097*
U.S. Cl. 430—110 **5 Claims**

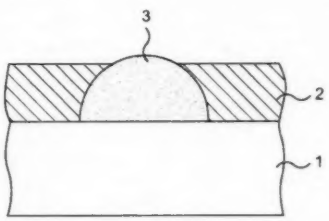
1. An electrophotographic toner which contains a zirconium compound obtained from an aromatic hydroxycarboxylic acid or its salt and a compound containing zirconium, as a charge-control agent.

US 6,410,199 B1

IMAGE RECEIVING SHEET AND RECORDING PROCESS

Nobuho Ikeuchi, Tokyo, and Masafumi Hayashi, Sayama, both of Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1999, Appl. No. 429,649
Claims priority, application Japan, Oct. 29, 1998, 10-308537
Int. Cl. B41M *5/00*
U.S. Cl. 430—124 **16 Claims**

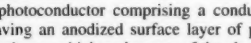


15. A method for recording an image onto an image receiving sheet, the method comprising the steps of:

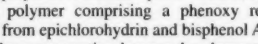
providing an image receiving sheet, the image receiving sheet including:

a substrate; and

a receptor layer over at least one side of said substrate, the receptor layer including a resin binder, the storage elasticity modulus of the resin binder being equal to or greater than 10^6 Pa at temperatures below about 40° C. and substantially satisfying the following relationships:



and



where G'_{130} is the storage elasticity modulus of the resin binder at 130° C. and

G'_{200} is the storage elasticity modulus of the resin binder at 200° C.;

transferring toner particles onto the receptor layer to form a pattern of the toner particles corresponding to the image to be recorded on the image receiving sheet; and

embedding the toner particles into the reception layer at a predetermined fixing temperature to fix the toner particles to the image receiving sheet, the predetermined temperature being within the range of about 130° C. to about 200° C.

US 6,410,200 B1

POLYMERIC COMPOSITION AND PRINTER/COPIER TRANSFER SHEET CONTAINING THE COMPOSITION

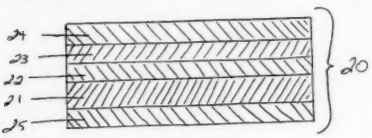
Scott Williams, 1532 Hemlock Farms, Hawley, Pa. 18428; Heather Penk, 820 Niles Ct., Santa Maria, Calif. 93454, and Heather Reid, 74 Burlington Ct., Hamburg, N.J. 07419

Provisional application No. 60/127,625, filed on Apr. 1, 1999.

This application Mar. 31, 2000, Appl. No. 541,083.

Int. Cl. G03C *1/805;11/12;* **G03G** *7/00;13/16;* **B44C** *1/165*

U.S. Cl. 430—126 **71 Claims**



1. A coated transfer sheet comprising:

a substrate having a first and second surface; and

at least one release layer overlaying said first surface, said release layer comprising a film-forming binder, an elastomeric emulsion, a water repellant and a plasticizer.

US 6,410,201 B2

THERMAL TRANSFER ELEMENT AND PROCESS FOR FORMING ORGANIC ELECTROLUMINESCENT DEVICES

Martin B. Wolk, Woodbury; Paul F. Baude, Maplewood; Jeffrey M. Florczak, Mapplewood; Fred B. McCormick, Maplewood, and Yong Hsu, Woodbury, all of Minn., assignors to 3M Innovative Properties Company, St. Paul, Minn.

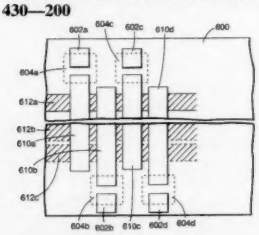
Continuation of application No. 09/662,078, filed on Sep. 14, 2000, now Pat. No. 6,291,116, which is a division of application No. 09/473,115, filed on Dec. 28, 1999, now Pat. No. 6,194,119, which is a continuation-in-part of application No. 09/231,723, filed on Jan. 15, 1999, now Pat. No. 6,114,088.

This application Jul. 24, 2001, Appl. No. 911,952.

This patent is subject to a terminal disclaimer.

Int. Cl. G03F *7/34;* **B44C** *1/165;* **B05D** *5/09*

U.S. Cl. 430—200 **31 Claims**



1. A method of transferring a multicomponent transfer unit to a receptor, the method comprising:

providing a receptor comprising a substrate and a receptor layer disposed on the substrate, wherein the receptor layer is formed of a first material;

providing a thermal transfer element comprising a substrate and a multicomponent transfer unit, the multicomponent transfer unit comprising a first layer formed of the first material;

contacting the receptor layer of the receptor and the first layer of the thermal transfer element; and

selectively heating the thermal transfer element to transfer the multicomponent transfer unit to the receptor according to a pattern to form at least a portion of both a first operational layer and a second operational layer of a multilayer device, wherein the first operational layer is configured and arranged to conduct or produce a charge carrier.

US 6,410,202 B1

THERMAL SWITCHABLE COMPOSITION AND IMAGING MEMBER CONTAINING CATIONIC IR DYE AND METHODS OF IMAGING AND PRINTING

James C. Fleming, Webster; Jeffrey W. Leon, Rochester; David A. Stegman, Churchville, and Kevin W. Williams, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 31, 1999, Appl. No. 387,116

Int. Cl. G03F *7/038*

U.S. Cl. 430—270.1 **38 Claims**

1. A composition for thermal imaging comprising:

a) a hydrophilic heat-sensitive ionomer,

b) water or a water-miscible organic solvent, and

c) an aromatic infrared radiation sensitive dye (IR dye) that is soluble in water or said water-miscible organic solvent, and has at least two quaternary ammonium groups,

wherein the heat-sensitive ionomer is selected from the following three classes of polymers:

I) a crosslinked or uncrosslinked vinyl polymer comprising recurring units comprising positively-charged, pendant N-alkylated aromatic heterocyclic groups,

II) a crosslinked or uncrosslinked polymer comprising recurring organoonium groups, and

III) a polymer comprising a pendant thiosulfate group.

US 6,410,203 B1

POSITIVE-TYPE PLANOGRAPHIC PRINTING MATERIAL

Ippei Nakamura, Shizuoka-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Feb. 23, 2000, Appl. No. 511,710

Claims priority, application Japan, Feb. 24, 1999, 11-047019

Int. Cl. G03F *7/039*

U.S. Cl. 430—270.1 **13 Claims**

1. A positive-type planographic printing material comprising:

(a) a water-insoluble and alkaline water-soluble polymer including a main chain and having a phenol structure on the main chain, the phenol structure having an aromatic ring and at least one electron-withdrawing substituent on the aromatic ring; and

(b) an infrared absorbing agent.

US 6,410,204 B1

POSITIVE PHOTORESIST COMPOSITION

Kunihiko Kodama; Kenichiro Sato, and Toshiaki Aoai, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 27, 2000, Appl. No. 669,907

Claims priority, application Japan, Sep. 27, 1999, 11-273160

Int. Cl. G03F *7/004*

U.S. Cl. 430—270.1 **10 Claims**

1. A positive photoresist composition comprising

(A) a compound which generates a sulfonic acid having naphthalene structure by the irradiation with actinic rays of a wavelength of 220 nm or less or radiation, and

(B) a resin whose solubility in an alkali developing solution increases by the action of an acid, wherein said resin is selected from the group consisting of resins containing a monocyclic alicyclic hydrocarbon structure, a polycyclic alicyclic hydrocarbon structure and a lactone structure.

US 6,410,205 B1

PHOTOSENSITIVE RECORDING MATERIAL PROVIDED WITH A COVERING LAYER

Thomas Leichsenring, Mainz; Thorsten Lifka, Aarbergen, and Mario Boxhorn, Mainz, all of Germany, assignors to AGFA-Gevaert, Belgium

Filed Sep. 12, 2000, Appl. No. 660,376

Claims priority, application Germany, Sep. 14, 1999, 199 44 073

Int. Cl. G03F *7/09;7/11*

U.S. Cl. 430—273.1 **18 Claims**

1. A photosensitive recording material comprising a base, a photopolymerizable layer and a covering layer, wherein the covering layer contains a mixture of at least one water-soluble or at least water-dispersible polymer and at least one additive, the additive being selected from the group consisting of alkoxylated alkylenediamines, phosphoric acid (C_1–C_{15}) alkyl esters and phosphoric acid (C_1–C_{15}) alkyl esters and the amount of additive being in the range of 0.001 to 10.0% by weight, relative to the total weight of the non-volatile components of the covering layer.

17. A process to prepare a cover layer which comprises applying an aqueous solution or dispersion containing at least one water-soluble or at least water-dispersible polymer and at least one additive, the additive being selected from the group consisting of alkoxylated alkylenediamines, phosphoric acid (C_1–C_{15}) alkyl esters and phosphoric acid (C_1–C_{15}) alkyl esters and the amount of additive being in the range of 0.001 to 10.0% by weight, relative to the total weight of the non-volatile components of the covering layer to a layer and drying said layer.

US 6,410,206 B1

PHOTOSENSITIVE RESIN COMPOSITION, COLOR FILTER, AND COPOLYMER RESIN USEFUL FOR THEM

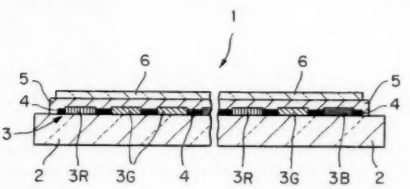
Kenji Ueda, and Shunsuke Sega, both of Tokyo-to, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Filed Feb. 24, 2000, Appl. No. 512,347

Claims priority, application Japan, Feb. 25, 1999, 11-49177; Feb. 25, 1999, 11-49178

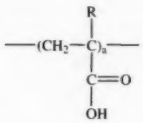
Int. Cl. G03F *7/038;7/028*

U.S. Cl. 430—280.1 **4 Claims**

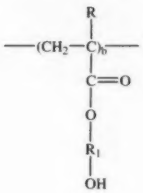


1. An epoxy-containing copolymer resin comprising 0 to 55% by mole of constituent units represented by formula (1), 5 to 95% by mole of constituent units represented by formula (2), and 5 to 95% by mole of constituent units represented by formula (3), the constituent units represented by formula (1) having been partially reacted, through carboxyl groups thereof, with a (meth)acryloylalkyl isocyanate compound, the constituent units represented by formula (2) having been partially reacted, through hydroxyl groups thereof, with a (meth)acryloylalkyl isocyanate compound, said copolymer resin containing 5 to 95% by mole of (meth)acryloyl groups and having an acid value of 0 to 400 mg KOH/g and a weight average molecular weight of 5,000 to 1,000,000 as determined using polystyrene as a standard:

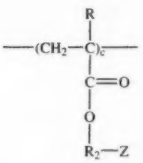
(1)



(2)



(3)



wherein R represents hydrogen or an alkyl group having 1 to 5 carbon atoms; R_1 represents an alkylene group having 2 to 4 carbon atoms; R_2 represents an alkylene group having 1 to 4 carbon atoms; Z represents a 1,2-epoxy, 1,3-epoxy, or 1,4-epoxy group; and a, b, and c are integers respectively corresponding to said molar percentages.

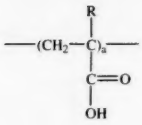
3. A photosensitive resin composition comprising:

an alkali-developable photocurable copolymer resin; an epoxy-containing copolymer resin; a bifunctional or higher polyfunctional photopolymerizable acrylate monomer; and an initiator added in an amount sufficient for photocuring to proceed that is a radical polymerization initiator or a photo-induced acid generator,

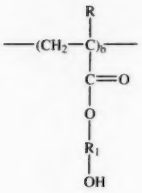
said alkali-developable photocurable copolymer resin comprising 5 to 55% by mole of constituent units represented by formula (1) and 5 to 95% by mole of constituent units represented by formula (2), the constituent units represented by formula (1) having been partially reacted, through carboxyl groups thereof, with a (meth)acryloylalkyl isocyanate compound, the constituent units represented by formula (2) having been partially reacted, through hydroxyl groups thereof, with (meth)acryloylalkyl isocyanate compound, said copolymer resin containing 5 to 95% by mole of (meth)acryloyl groups and having an acid value of 5 to 400 mg KOH/g and a weight average molecular weight of 5,000 to 1,000,000 as determined using polystyrene as a standard,

said epoxy-containing copolymer resin comprising 0 to 55% by mole of constituent units represented by formula (1), 5 to 95% by mole of constituent units represented by formula (2), and 5 to 95% by mole of constituent units represented by formula (3), the constituent units represented by formula (1) having ben partially reacted, through carboxyl groups thereof, with a (meth)acryloylalkyl isocyanate compound, the constituent units represented by formula (2) having been partially reacted, through hydroxyl groups thereof, with a (meth)acryloylalkyl isocyanate compound, said copolymer resin containing 5 to 95% by mole of (meth)acryloyl groups and having an acid value of 0 to 400 mg KOH/g and a weight average molecular weight of 5,000 to 1,000,000 as determined using polystyrene as a standard:

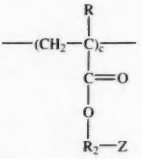
(1)



(2)



(3)



wherein R_1 represents hydrogen or an alkyl group having 1 to 5 carbon atoms; RE represents an alkylene group having 2 to 4 carbon atoms; R_2 represents an alkylene group having 1 to 4 carbon atoms; Z represents a 1,2-epoxy, 1,3-epoxy, or 1,4-epoxy group; and a, b, and c are integers corresponding respectively to contents in terms of % by mole of the constituent units.

US 6,410,207 B1

POSITIVE PHOTOSENSITIVE COMPOSITION, POSITIVE PHOTOSENSITIVE LITHOGRAPHIC PRINTING PLATE AND METHOD FOR MAKING POSITIVE PHOTOSENSITIVE LITHOGRAPHIC PRINTING PLATE

Hideki Nagasaka, and Akihisa Murata, both of Kanagawa, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Division of application No. 08/906,258, filed on Aug. 5, 1997, now Pat. No. 6,326,122. This application Jan. 10, 2000, Appl. No. 480,161.

Claims priority, application Japan, Aug. 6, 1996, 8-207013; Nov. 14, 1996, 8-302722; Jan. 22, 1997, 9-9264

Int. Cl. G03F *7/30*

U.S. Cl. 430—302 **40 Claims**

1. A method for making a lithographic printing plate, comprising:

exposing a positive photosensitive lithographic printing plate comprising a positive photosensitive composition on a support, wherein the positive photosensitive composition comprises

(a) a photo-thermal conversion material, and

(b) a high molecular compound

wherein said high molecular compound (b) has a solubility in an aqueous alkali developer which changes as a result of a change, other than a chemical change, in said high molecular compound (b);

wherein the solubility in an aqueous alkali developer of said composition is greater in a photo-thermally exposed portion than a non-exposed portion;

wherein said exposing is accomplished by means of a light ray belonging to a wavelength region of from 650 to 1300 nm and having a light intensity of at least 2×10^6 mJ/s·cm^2, and developing the positive photosensitive lithographic printing plate with an alkali developer,

wherein said photosensitive composition has substantially no photosensitivity to ultraviolet light.

7. A method for making a lithographic printing plate, comprising:

exposing a positive photosensitive lithographic printing plate comprising a positive photosensitive composition on a support, wherein the positive photosensitive composition comprises

(a) a photo-thermal conversion material, and

(b) a high molecular compound

wherein said high molecular compound (b) has a solubility in an aqueous alkali developer which changes as a result of a change, other than a chemical change, in said high molecular compound (b);

wherein the solubility in an aqueous alkali developer of said composition is greater in a photo-thermally exposed portion than a non-exposed portion;

wherein said exposing is accomplished by means of a light ray belonging to a wavelength region of from 650 to 1300 nm and having a light intensity of at least 2×10^6 mJ/s·cm^2, and developing the positive photosensitive lithographic printing plate with an alkali developer,

wherein the positive photosensitive composition further contains (c) a solubility-suppressing agent, wherein said solubility-suppressing agent (c) is capable of lowering the dissolution rate of a blend of component (a) and component (b) in said aqueous alkali developer, and

wherein the solubility-suppressing agent (c) is a compound having substantially no photosensitivity to ultraviolet light.

8. A method for making a positive photosensitive lithographic printing plate comprising exposing a positive photosensitive lithographic printing plate having a positive photosensitive composition on a support, said photosensitive composition comprising

(a) a photo-thermal conversion material; and

(b) a high molecular compound;

wherein the solubility in an aqueous alkali developer of said composition is greater in a photo-thermally exposed portion than a non-exposed portion;

with the proviso that

$$B<A,$$

where A is the solubility in an alkali developer at an exposed portion of the composition, and B is an alkali solubility after heating of the exposed portion;

wherein said exposing is accomplished by means of a light ray belonging to a wavelength region of from 650 to 1300 nm and having a light intensity of at least 2×10^6 mJ/s·cm^2, and developing the positive photosensitive lithographic printing plate with an alkali developer,

wherein said photosensitive composition has substantially no photosensitivity to ultraviolet light.

US 6,410,208 B1

LITHOGRAPHIC PRINTING PLATES HAVING A THERMO-DEACTIVATABLE PHOTOSENSITIVE LAYER

Gary Ganghui Teng, 10 Kendall Dr., Nothborough, Mass. 01532

Filed Apr. 18, 2001, Appl. No. 837,130

Int. Cl. G03F *7/038;7/039*

U.S. Cl. 430—302 **34 Claims**

1. A method of processing a lithographic printing plate, comprising in order:

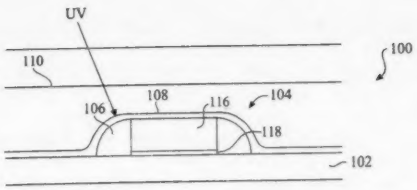
(a) providing a lithographic printing plate comprising on a substrate a thermo-deactivatable photosensitive layer, said photosensitive layer being photohardenable before exposure to an infrared radiation and being capable of becoming non-photohardenable or having reduced rate of photohardening in the exposed areas upon exposure to an infrared radiation, wherein said photosensitive layer exhibits an affinity or aversion substantially opposite to the affinity or aversion of said

substrate to at least one printing liquid selected from the group consisting of ink and an abhesive fluid for ink;

(b) imagewise exposing the plate with the infrared radiation to render the photosensitive layer incapable or having reduced rate of photohardening, without causing hardening of the photosensitive layer, in the exposed areas;

(c) overall exposing the plate with an actinic radiation at a suitable dosage to cause hardening of the photosensitive layer in the infrared radiation non-exposed areas and not in the infrared radiation exposed areas; and

(d) developing the plate to remove the photosensitive layer in the infrared radiation exposed areas and not in the infrared radiation non-exposed areas.



US 6,410,209 B1

METHODS UTILIZING ANTIREFLECTIVE COATING COMPOSITIONS WITH EXPOSURE UNDER 200 NM

Timothy G. Adams, Sudbury; Edward K. Pavelchek, Stow; Roger F. Sinta, Woburn; Manuel DoCanto, Stoughton; Robert F. Blacksmith, Hubbardston, and Peter Trefonas, III, Medway, all of Mass., assignors to Shipley Company, L.L.C., Marlborough, Mass.

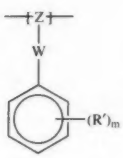
Filed Sep. 15, 1998, Appl. No. 153,575

Int. Cl. G03C *5/00;* **G03F** *7/26;7/09*

U.S. Cl. 430—311 **9 Claims**

1. A method for forming a photo resist relief image comprising:

(a) applying on a substrate a layer of an antireflective composition that comprises an acid or acid generator compound, a crosslinker material, and a resin that comprises a structure of the following formula:



where W is a chemical bond, an alkyl linkage, or an ester linkage;

each R' is hydrogen, optionally substituted alkyl, optionally substituted alkoxy, ester, optionally substituted alkanoyl, optionally substituted carbocyclic aryl, or optionally substituted aralkyl;

m is an integer of from 0 to 5; and each Z is independently a bridge group between polymer units;

(b) thermally curing the antireflective composition layer;

(c) applying a layer of a photoresist composition over the antireflective composition layer;

(d) exposing the photoresist layer to radiation having a wavelength of below about 200 nm and developing the exposed photoresist layer.

US 6,410,210 B1

SEMICONDUCTOR BLOCKING LAYER FOR PREVENTING UV RADIATION DAMAGE TO MOS GATE OXIDES

Calvin Todd Gabriel, Cupertino, Calif., assignor to Philips Semiconductors, New York, N.Y.

Filed May 20, 1999, Appl. No. 315,596

Int. Cl. G03C *1/825*

U.S. Cl. 430—315 **14 Claims**

1. An apparatus for preventing damage to gate oxide due to ultraviolet radiation associated with semiconductor processes, comprising:

a substrate;

a gate formed on the substrate and including a gate material layer and a gate oxide layer positioned between the substrate and the gate material layer;

a pair of spacers positioned on opposite sides of the gate;

an ultraviolet radiation blocking material deposited over the gate and the spacers for preventing the ultraviolet radiation from damaging the gate oxide layer of the gate, wherein the ultraviolet radiation blocking material includes TiO_2; and

at least one metal and intermetal oxide layer positioned over the ultraviolet radiation blocking material.

US 6,410,211 B2

METHOD FOR MANUFACTURING A LIQUID CRYSTAL DISPLAY DEVICE

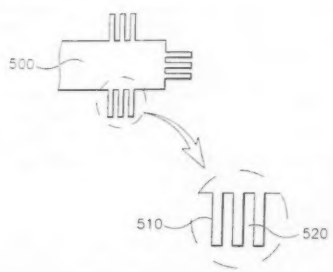
Sung Joon Bae, Kyoungki-do, Rep. of Korea, assignor to LG Electronics, Inc., Seoul, Rep. of Korea

Filed Nov. 25, 1998, Appl. No. 200,200

Claims priority, application Rep. of Korea, Nov. 27, 1998, 97-63559

Int. Cl. G03F *7/00*

U.S. Cl. 430—318 **20 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

providing a substrate;

forming a first metal layer on the substrate;

forming a photo-resist on the first metal layer; and

exposing and developing the photo-resist using an exposure system and only a single mask having lines and spaces, a width of each line being about 1 μm, such that the photo-resist has a pattern including a thick portion and a thin portion, the pattern being a comb shape.

US 6,410,212 B1
METHOD FOR MAKING A THIN FILM MAGNETIC HEAD

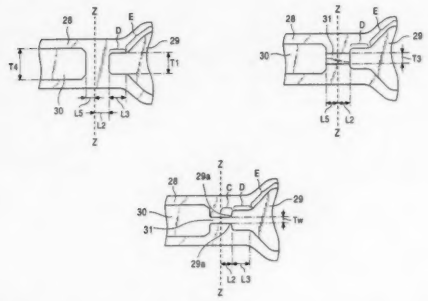
Kiyoshi Sato, Niigata-ken, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Division of application No. 09/337,603, filed on Jun. 21, 1999, now Pat. No. 6,327,116. This application Nov. 28, 2000, Appl. No. 724,455.

Claims priority, application Japan, Jun. 30, 1998, 10-184390; Jul. 9, 1998, 10-194145

Int. Cl. G11B *5/127*

U.S. Cl. 430—320 **4 Claims**



1. A method for making a thin-film magnetic head comprising a magnetic lower core layer, a nonmagnetic gap layer formed on the lower core layer, and a magnetic upper core layer formed on the gap layer, the method comprising the steps of:

forming the gap layer on the lower core layer, forming a coil layer on the gap layer at a position behind an opposing surface facing a recording medium, and then forming an insulating layer on the coil layer;

forming a magnetic underlying layer over the gap layer exposed in the vicinity of the opposing surface and the insulating layer at the rear portion, and then forming a resist layer on the underlying layer;

forming, by an exposing and developing process, a pattern for a middle region of the upper core layer in the resist layer lying at a region towards the rear portion with a given distance from the opposing surface, the middle region having a constant width larger than the track width, and a pattern for a trailing region lying towards the rear portion, the trailing region having an increasing width towards the rear portion, and simultaneously forming a pattern for a dummy region in the resist layer lying at a region towards a front section with a given distance from the opposing surface, the dummy region having a width larger than the track width;

forming, by an exposing and developing process, a pattern for a leading region of the upper core layer in the resist layer between the pattern for the middle region and the pattern for the dummy region, the leading region having a constant width smaller than the width of the dummy region so that the pattern for the leading region connects the pattern for the middle region and the pattern for the dummy region;

forming a magnetic layer in the patterns for the leading region, the middle region, the trailing region and the dummy region by a plating process, and then removing the residual resist layer; and

removing the magnetic layer formed in the pattern for the dummy region and the magnetic layer formed in the pattern for the leading region lying in front of the opposing surface to expose the leading region, having the track width T_W, of the upper core layer.

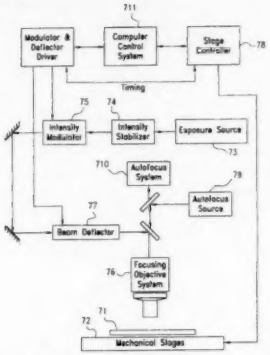
US 6,410,213 B1
METHOD FOR MAKING OPTICAL MICROSTRUCTURES HAVING PROFILE HEIGHTS EXCEEDING FIFTEEN MICRONS

Daniel H. Raguin, Spencerport; G. Michael Morris, Faiport, and Peter M. Emmel, Pittsford, all of N.Y., assignors to Corning Incorporated, Rochester, N.Y.

Filed Jun. 9, 1998, Appl. No. 94,340

Int. Cl. G03F *7/20*

U.S. Cl. 430—321 **14 Claims**



1. A method for fabricating an optical microstructure on a substrate comprising the steps of:

coating the substrate with a photosensitive material to produce a photosensitive material coating to a height exceeding 15 μm;

producing a surface-relief microstructure pattern on the photosensitive material coating by a single-step exposure of the photosensitive material coating with a scanning beam of electromagnetic radiation, wherein said scanning beam is focused onto a portion of the photosensitive material where said pattern is to be formed, and said beam is multiply translated across said portion while changing its intensity with an optical modulator to provide a scanning beam having an exposure dosage varying with said translations over the photosensitive material coating to produce an optical microstructure pattern as a result of the photosensitive material coating responding to the electromagnetic radiation, wherein a width of said focused beam is smaller than a width of said pattern, and

developing said exposed pattern in said photosensitive material to form an optical microstructure.

US 6,410,214 B1
METHOD FOR MANUFACTURING BLACK MATRIX OF PLASMA DISPLAY PANEL

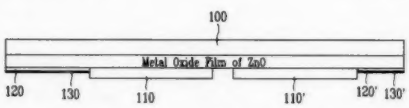
Jeong Jun Kim, Kyungsangbuk-do, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Sep. 29, 1999, Appl. No. 406,845

Claims priority, application Rep. of Korea, Oct. 1, 1998, 98/41479

Int. Cl. H01J *17/04*

U.S. Cl. 430—321 **26 Claims**



1. A method for manufacturing a black matrix of a plasma display panel comprising:

forming transparent electrodes of upper electrode patterns and black matrix patterns on an upper substrate; and

depositing a predetermined metal material on the transparent electrodes of the black matrix patterns.

US 6,410,215 B1
HIGH TEMPERATURE COLOR DEVELOPMENT OF PHOTOGRAPHIC SILVER BROMOIODIDE COLOR NEGATIVE FILMS USING PH STABILIZED COLOR DEVELOPER

David Leroy Cole, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 27, 1996, Appl. No. 708,163
Int. Cl. G03C *7/407;7/413*
U.S. Cl. 430—374 **14 Claims**

1. A method of photoprocessing comprising:

contacting an imagewise exposed color negative photographic film element containing at least one silver bromoiodide emulsion, with a color developer solution having a pH of from about 9.0 to 9.7, and comprising:

a color developing agent present at from about 0.02 to about 0.1 mol/l,

bromide ions at from about 5×10^{-5} to about 0.4 mol/l,

iodide ions at from about 5×10^{-7} to about 0.01 mol/l, borate buffer sufficient to maintain said pH, and

an organic antioxidant present at from about 0.005 to about 0.5 mol/l, said antioxidant having the formula:

R—N(OH)—R'

wherein R and R' are independently hydrogen, substituted or unsubstituted alkyl of 1 to 10 carbon atoms or substituted or unsubstituted aryl,

said contacting being carried out at from about 55 to about 65° C. for from about 20 to about 150 seconds,

wherein said photographic film element exhibits a ΔD_{min} of less than 30% when it is processed with said color developer solution for 45 seconds at 60° C., provided said color developer solution has been maintained or used at 60° C. for up to 144 hours.

US 6,410,216 B1
METHOD OF FORMING A PHOTOGRAPHIC COLOR IMAGE

David Clarke, Watford, and Paul Louis Reginald Stanley, Wealdstone, both of United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 14, 1994, Appl. No. 275,204
Int. Cl. G03C *1/46*
U.S. Cl. 430—505 **9 Claims**

1. A color photographic material comprising at least two color-forming units sensitive to different regions of the spectrum each comprising a silver halide emulsion layer wherein the material contains in at least one said silver halide emulsion layer, a ballasted sulphonhydrazide color developing agent and a 3-pyridinol photographic color coupler capable of forming a magenta dye upon coupling with the oxidized form of said developing agent, both incorporated therein in droplets of a high boiling solvent.

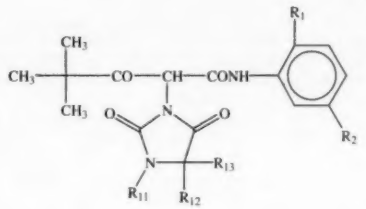
US 6,410,217 B2
HEAT-DEVELOPABLE COLOR LIGHT-SENITIVE MATERIAL

Kazuki Uehara, and Nobuhiro Nishita, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa-ken, Japan

Filed Mar. 1, 2001, Appl. No. 795,363
Claims priority, application Japan, Mar. 2, 2000, 2000-058031
Int. Cl. G03C *8/10;8/52;7/36;7/392*
U.S. Cl. 430—523 **8 Claims**

1. A heat-developable color light-sensitive material containing at least, on a support, a light-sensitive silver halide emulsion, a binder, and a dye-providing compound, wherein the light-sensitive material contains at least one compound represented by formula (I):

formula (I)



wherein the at least one compound represented by formula (I) is added to a protective layer in an amount of 0.01 mg/m^2 or more and 200 mg/m^2 or less, and

wherein R_1 represents a chlorine atom or an alkoxy group, R_2 represents an acylamino group or an alkoxycarbonyl group, R_{11} represents a hydrogen atom or an alkyl group, R_{12} and R_{13} each represent a hydrogen atom, an alkyl group, or an alkoxy group, in which R_{12} and R_{13} may be the same or different from, and wherein the material does not contain any aminophenols as an electron-transfer agent.

US 6,410,218 B2
PLASMA-LIKE SOLUTION

Paul E. Segall; Hal Sternberg; Harold D. Waitz, and Judith M. Segall, all of Berkeley, Calif., assignors to BioTime, Inc., Berkeley, Calif.

Division of application No. 08/839,021, filed on Apr. 23, 1997, now Pat. No. 5,968,726, which is a continuation of application No. 08/253,384, filed on Jun. 3, 1994, now Pat. No. 5,702,880, which is a continuation-in-part of application No. 08/133,527, filed on Oct. 7, 1993, now abandoned, which is a continuation-in-part of application No. 08/071,533, filed on Jun. 4, 1993, now Pat. No. 5,407,428. This application Mar. 31, 1998, Appl. No. 52,827.
This patent is subject to a terminal disclaimer.
Int. Cl. A01N *1/02*
U.S. Cl. 435—1.2 **16 Claims**

1. A terminally heat sterilized aqueous solution comprising:

a hydroxyethyl starch having an average molecular weight of at least 150,000 daltons;

Na^+ in an amount ranging from 70 to 160 mM;

Cl^- in an amount ranging from 70 to 160 mM;

K^+ in an amount ranging from 0 to 5 mM;

Ca^{2+} in an amount ranging from 0.5 to 4 mM;

a dynamic buffering system;

a simple sugar in an amount from 2 to 50 mM; and

magnesium ion in a range of from 0 to 10 mM;

wherein said solution is a physiologically compatible blood substitute; and

wherein said solution is terminally heat sterilized and does not include a conventional biological buffer.

US 6,410,219 B1

TREATING BLOOD OR BLOOD PRODUCTS WITH COMPOUNDS WHICH HAVE A MUSTARD, AZIRDINIUM OR AZIRIDINE GROUP AND A NUCLEIC ACID BINDING GROUP

David Cook; Susan Wollowitz, both of Walnut Creek, and Aileen Nerio, Santa Clara, all of Calif., assignors to Cerus Corporation, Concord, Calif.

Continuation of application No. 08/486,821, filed on Jun. 7, 1995, now Pat. No. 6,171,777, which is a continuation-in-part of application No. 08/338,040, filed on Nov. 14, 1994, now Pat. No. 5,691,132. This application Mar. 30, 2000, Appl. No. 539,226.

This patent is subject to a terminal disclaimer.

Int. Cl. A01N *1/02;* **C12N** *7/06*

U.S. Cl. 435—2 **78 Claims**

1. An in vitro method of inactivating a pathogen in mammalian blood or a mammalian blood product comprising:

(a) contacting in vitro mammalian blood or a mammalian blood product, with a pathogen inactivating amount of a first compound that has a nucleic acid binding ligand and a moiety selected from the group consisting of a mustard group, an aziridinium, and an aziridine, which when incubated with the blood or blood product results in the inactivation of at least 1 log of a pathogen present in the blood or blood product, if any,

(b) and recovering the pathogen inactivated blood or blood product, wherein the recovered blood or blood product has substantially the same biological activity such that it is suitable for therapeutic use in a mammal,

wherein the first compound has a greater inactivation efficiency against R17 than a second compound containing a mustard group, aziridinium, or aziridine that lacks the nucleic acid binding ligand.

US 6,410,220 B1

SELF-ASSEMBLING GENES, VECTORS AND USES THEREOF

Clague P. Hodgson; Mary Ann Zink, and Guoping Xu, all of Lincoln, Nebr., assignors to Nature Technology Corp, Omaha, Nebr.

PCT No. PCT/US98/03918, § 371 Date Aug. 26, 1999, § 102(e) Date Aug. 26, 1999, PCT Pub. No. WO98/38326, PCT Pub. Date Sep. 3, 1998

Provisional application No. 60/070,910, filed on Feb. 28, 1997. This PCT application Feb. 28, 1998, Appl. No. 380,190.

Int. Cl. C12Q *1/00;1/68;* **C12N** *15/63;* **C07H** *21/04;21/02*

U.S. Cl. 435—4 **10 Claims**

1. A method for isolating and identifying promoters comprising the steps of:

a) providing a vector comprising a portion of a promoter region from a retrovirus transposon Long Terminal Repeat (LTR) and having two non-complementary overhanging termini, said vector being generated by digesting the vector with one or more class IIS restriction enzymes, creating non-complementary termini for directional joining of promoter sequences with the vector;

b) designing two PCR primers to amplify a region of a retrovirus transposon LTR promoter from template nucleic acid to produce a nucleic acid fragment, wherein said primers comprise at least one predetermined restriction endonuclease recognition site that recognizes a restriction endonuclease that cleaves at a distance from the recognition site and creates non-palindromic overhanging termini, a sequence complementary to the template nucleic acid, and bases positioned at the restriction endonuclease cleavage site that form non-palindromic overhanging termini after cleavage by the restriction endonuclease and are selected to be complementary to only one of the overhanging termini of the vector;

c) combining the primers with template nucleic acid and performing a polymerase chain reaction to produce multiple copies of the template nucleic acid to form amplified template fragments incorporating the restriction endonuclease recognition site;

d) digesting the amplified template fragments with one or more restriction endonucleases that recognize the restriction endonuclease recognition site of the primers to create digested template fragments having non-palindromic overhanging termini that are complementary to the respective termini of the vector;

e) combining the digested template fragments in a ligation reaction with the vector to produce a gene vector with an intact LTR sequence;

f) transforming the vector with an intact LTR sequence into at least one cell type; and

g) selecting for expression from the LTR sequence in said cell type;

whereby expression from the LTR sequence identifies a promoter.

US 6,410,221 B1

ENTOMOPOXVIRUS EXPRESSION SYSTEM

Richard W. Moyer; Richard L. Hall, both of Gainesville; Michael E. Gruidl, Tampa, and Yi Li, Gainesville, all of Fla., assignors to University of Florida Research Foundation, Inc., Gainesville, Fla.

Continuation of application No. 08/544,332, filed on Oct. 17, 1995, now Pat. No. 5,935,777, which is a continuation-in-part of application No. 08/107,755, filed on Nov. 22, 1993, now Pat. No. 5,721,352, which is a continuation-in-part of application No. 07/991,867, filed on Dec. 7, 1992, now Pat. No. 5,476,781, which is a continuation-in-part of application No. PCT/US92/00855, filed on Feb. 12, 1992, now Pat. No. 5,721,352, which is a continuation-in-part of application No. 07/827,685, filed on Jan. 30, 1992, now abandoned, which is a continuation-in-part of application No. 07/657,584, filed on Feb. 19, 1991, now abandoned. This application Aug. 9, 1999, Appl. No. 370,861.

This patent is subject to a terminal disclaimer.

Int. Cl. C12Q *1/68;1/70;* **C12N** *15/863;5/10*

U.S. Cl. 435—5 **10 Claims**

1. An Entomopoxvirus spheroidin gene polynucleotide sequence free from association with other viral nucleotide sequences with which it is associated in nature, characterized by the ability to direct the expression of an heterologous gene to which said sequence or a functional fragment of said sequence is operably linked within a selected host cell, wherein said sequence is either an active spheroidin promoter sequence operably linked to said heterologous gene directly, or said sequence is an active spheroidin promoter operably linked to spheroidin coding sequences which in turn are operably linked to said heterologous gene.

US 6,410,222 B1

IN OVO VACCINATION OF MAREK'S DISEASE TYPE I VIRUS

Kenji Yokogawa; Masashi Sakaguchi, and Eiji Tokunaga, all of Kumamoto, Japan, assignors to Juridical Foundation The Chemosero-Therapeutic Research Institute, Kumamoto-ken, Japan

PCT No. PCT/JP99/06866, § 371 Date Aug. 11, 2000, § 102(e) Date Aug. 11, 2000, PCT Pub. No. WO00/35476, PCT Pub. Date Jun. 22, 2000

PCT Filed Feb. 8, 1999, Appl. No. 622,093

Claims priority, application Japan, Dec. 14, 1998, 10-354017

Int. Cl. C12Q *1/70;* **A61K** *39/245*

U.S. Cl. 435—5 **11 Claims**

1. A method for immunizing chickens which comprises inoculating into a growing egg a composition comprising either cell-free attenuated live viruses of Marek's disease type 1 or cells infected with attenuated live viruses of Marek's disease type 1 capable of producing cell-free viruses.

US 6,410,223 B1
DIRECT POLYMERASE CHAIN REACTION ASSAY, OR BIO-PCR
Norman W. Schaad, Myersville, Md.; Nikolas J. Panopoulos, Iraklio-Crete, Greece, and Efstathios Hatziloukas, Frederick, Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Nov. 4, 1994, Appl. No. 334,085
Int. Cl. C12Q *1/68*
U.S. Cl. 435—6 4 Claims

1. A method for the detection of target DNA-containing cells or microorganisms in a sample, said method comprising
a) culturing said cells or microorganisms in order to increase the number of cells or microorganisms in the sample,
b) removing the cultured cells or microorganisms from culture,
c) performing enzymatic amplification of a target DNA sequence of the cultured cells or microorganisms to produce amplification products by direct polymerase chain reaction, wherein said direct polymerase chain reaction is performed on said cultured cells or microorganisms without prior processing of said cultured cell or microorganism sample, and
d) detecting the amplification products as an indication of the presence of target DNA-containing cells or microorganisms.

US 6,410,224 B1
RIBOZYME TREATMENT OF DISEASES OR CONDITIONS RELATED TO LEVELS OF NF-κB
Dan T. Stinchcomb; Kenneth G. Draper, and James McSwiggen, all of Boulder, Colo., assignors to Ribozyme Pharmaceuticals, Inc., Boulder, Colo.
Continuation of application No. 08/291,932, filed on Aug. 15, 1994, now Pat. No. 5,658,780, which is a continuation-in-part of application No. 08/245,466, filed on May 18, 1994, now abandoned, which is a continuation-in-part of application No. 07/987,132, filed on Dec. 7, 1992, now abandoned. This application Dec. 23, 1996, Appl. No. 777,916.
This patent is subject to a terminal disclaimer.
Int. Cl. C07H *21/04*; C12Q *1/68*
U.S. Cl. 435—6 4 Claims

1. A method for specifically cleaving RNA encoding a Rel-A subunit of NF-k B protein using an enzymatic RNA molecule, comprising the step of contacting said RNA with said enzymatic RNA molecule under conditions suitable for said cleaving.

US 6,410,225 B1
PURIFICATION OF OLIGOMERS
Brian S. Sproat, Adelebsen, Germany, assignor to Yale University, New Haven, Conn., and Ribozyme Pharmaceuticals, Inc., Boulder, Colo.
Filed Jun. 27, 1997, Appl. No. 883,712
Int. Cl. C12Q *1/68*
U.S. Cl. 435—6 30 Claims

1. A composition comprising

$$D\text{-}Si(Y)_3$$

wherein D represents
X-, X-Z-, V-, V-Z-, W, or W-Z-,
wherein X is a compound of interest, Z is a linking group, V is a leaving group, and W is a reactive group,
wherein each Y is independently a capture tag or substituted or unsubstituted $C_{1\text{-}20}$ straight, branched or cyclic alkyl, aralkyl, aryl, alkaryl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkynyloxy, heteroalkyl, heterocyclic, alkyl-heterocyclic, or heterocyclic-alkyl,
wherein at least one Y is a capture tag,
wherein substituents are independently hydroxy, thio, amine, ether, thioether, keto, carboxy, alkenyl, alkynyl, phosphorus derivatives, or carbonyl.

US 6,410,226 B1
MAMMALIAN AND HUMAN REC2
Eric B. Kmiec, Yardley, Pa.; William K. Holloman, Yorktown Heights, N.Y.; Michael C. Rice, Newtown, Pa.; Sheryl T. Smith, Bryn Mar, Pa., and Zhigang Shu, Bensalem, Pa., assignors to Thomas Jefferson University, Philadelphia, Pa., and Cornell Research Foundation, Inc., Ithaca, N.Y.
Provisional application No. 60/025,929, filed on Sep. 11, 1996. This application Sep. 11, 1997, Appl. No. 927,165.
Int. Cl. C12Q *1/68*; C12P *19/34*; C07H *21/04*
U.S. Cl. 435—6 10 Claims

1. A method of classifying a sample of human tissue for a decrease in susceptibility to UVC-induced mutation, the method comprising:
(1) quantifying the copies of hsREC2 per diploid genome of the sample tissue; and
(2) comparing the quantity of hsREC2 per diploid genome of the sample tissue with the quantity of hsREC2 per diploid genome of a standard tissue which contains the normal number of copies of hsREC2 per diploid genome,
wherein an increase in the quantity of hsREC2 per diploid genome in the sample tissue compared to the quantity of hsREC2 in the standard tissue indicates a decrease of the human tissue to susceptibility to UVC-induced mutation.

US 6,410,227 B1
DNA MARKERS FOR LITTER SIZE
John Alan Mileham, Comberton; Graham Stuart Plastow, Shipdham, and Olwen Irene Southwood, Wantage, all of United Kingdom, assignors to Dalgety PLC, London, United Kingdom
Continuation of application No. PCT/GB96/01408, filed on Jun. 12, 1996. This application Dec. 12, 1997, Appl. No. 989,915.
Claims priority, application United Kingdom, Jun. 12, 1995, 9511888
Int. Cl. C12Q *1/68*; C12P *19/34*; C07H *21/02*
U.S. Cl. 435—6 21 Claims

1. A method for screening pigs to determine those more likely to produce larger litters, and/or those less likely to produce larger litters, which method comprises the steps:
(i) obtaining a sample of genomic DNA from a pig; and
(ii) analysing the genomic DNA obtained in (i) to determine which osteopontin (OPN) allele(s) is/are present.

US 6,410,228 B1
METHOD FOR THE IDENTIFICATION OF SYNTHETIC CELL- OR TISSUE- SPECIFIC TRANSCRIPTIONAL REGULATORY REGIONS
Robert J. Schwartz, Houston, Tex.; Eric M. Eastman, Highland, Md.; Xuyang Li, Houston, and Jeff Nordstrom, College Station, both of Tex., assignors to Baylor College of Medicine, Houston, Tex., and Valentis, Inc., Burlingame, Ga.
Provisional application No. 60/052,403, filed on Jul. 14, 1997. This application Jul. 14, 1998, Appl. No. 115,407.
Int. Cl. C12Q *1/68*; G01N *33/53*; C12N *5/00;5/02;5/06*
U.S. Cl. 435—6 19 Claims

1. A method of identifying binding sites for transcription factors, comprising the step of:
identifying oligonucleotides in oligonucleotide-protein complexes formed between one or more proteins of a cellular or nuclear extract and any of a plurality of double-stranded oligonucleotide fragments in a mixture of said fragments and said extract wherein said complexes are separated from free oligonucleotides in said mixture using size exclusion chromatography; and
wherein the presence of a said oligonucleotide in a said complex is indicative that said oligonucleotide comprises a said binding site.

US 6,410,229 B1

EXPRESSION MONITORING BY HYBRIDIZATION TO HIGH DENSITY NUCLEIC ACID ARRAYS

David J. Lockhart, Santa Clara, Calif.; Eugene L. Brown, Newton Highlands, Mass.; Gordon G. Wong, Brookline, Mass.; Mark S. Chee, Palo Alto, and Thomas R. Gingeras, Encinitas, both of Calif., assignors to Affymetrix, Inc., Santa Clara, Calif.

Continuation of application No. 08/529,115, filed on Sep. 15, 1995, now Pat. No. 6,040,138. This application Dec. 14, 1998, Appl. No. 212,004.

This patent is subject to a terminal disclaimer.

Int. Cl. C12Q *1/68;* **C07H** *21/04;21/02;21/00*

U.S. Cl. 435—6 **36 Claims**

1. A method of analyzing the expression of one or more genes, said method comprising:

(a) providing a pool of target nucleic acids comprising RNA transcripts of one or more of said genes, or nucleic acids derived therefrom using said RNA transcripts as templates;

(b) hybridizing said pool of target nucleic acids to an array of nucleic acid probes immobilized on a surface, said array comprising more than 100 different nucleic acids, at least some of which comprise control probes, wherein each different nucleic acids is localized in a known location of said surface, the density of said different nucleic acids is grater than about 100 different nucleic acids per 1 cm^2, and at least some of said nucleic acid probes are complementary to said RNA transcripts or said nucleic acids derived therefrom using said RNA transcripts; and

(c) quantifying the hybridization of said nucleic acids to said array by comparing binding of matched and control probes.

US 6,410,230 B1

GLYCERALDEHYDE-3-PHOSPHATE DEHYDROGENASE AND NUCLEAR RESTORATION OF CYTOPLASMIC MALE STERILITY

Gregory G. Brown, Montreal; Benoit Landry, L'Acadie, and Martine Jean, Sainte-Foy, all of Canada, assignors to McGill University, Montreal, Canada

Continuation of application No. PCT/CA97/00424, filed on Jun. 16, 1997, Provisional application No. 60/020,533, filed on Jun. 26, 1996. This application Dec. 23, 1998, Appl. No. 219,194.

Int. Cl. C12Q *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **2 Claims**

1. A method for detecting the presence of a restorer gene in nuclear genomic DNA of a Brassica plant, said method comprising the steps of:

i) hybridizing said nuclear genomic DNA under stringent conditions with a probe specific for nuclear restoration of cytoplasmic male sterility of plants, said probe comprising the nucleic acid sequence of SEQ ID NO: 1 or a sufficient hybridizing fragment thereof; and

ii) detecting hybridization of said probe with said nuclear genomic DNA, wherein said hybridization is indicative of the presence of a restorer gene sequence in said nuclear genomic DNA.

US 6,410,231 B1

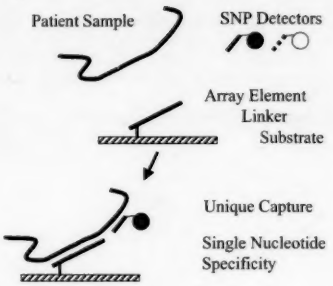
SNP DETECTION

Lyle Arnold, Paway; Thomas Theriault, Manhattan Beach, and Tod Bedilion, San Carlos, all of Calif., assignors to Incyte Genomics, Inc., Palo Alto, Calif.

Filed Feb. 26, 1999, Appl. No. 259,898

Int. Cl. C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **20 Claims**



1. A method for detecting multiple SNPs in a population of target polynucleotides in parallel, the method comprising the steps of:

(a) combining sample polynucleotides; capture polynucleotides and SNP probes under conditions wherein:

a subset of the sample polynucleotides are target polynucleotides, each comprising a different capture region and a different SNP region comprising a corresponding different SNP,

the capture polynucleotides are immobilized and arrayed at corresponding discrete elements on a substrate and each capture polynucleotide comprises a sequence which specifically hybridizes to a corresponding different capture region,

each SNP probe comprises a sequence complementary to a corresponding different SNP region,

the target polynucleotides are immmobilized by hybridizing to the capture polynucleotides whereby each target polynucleotide is immobilized at a corresponding discrete element of the substrate to provide a first discrimination of the sample polynucleotides, and

the relative affinity of each SNP probe for the corresponding SNP region is sufficient to provide selective hybridization of the SNP probe to the corresponding SNF region, whereby each SNP probe selectively hybridizes to the corresponding SNP region to provide a second discrimination of the sample polynucleotides; and

(b) detecting the presence of each SNP probe on the substrate, wherein the presence of a given SNP probe at a given element indicates the presence of the corresponding SNP in the corresponding target polynucleotide.

US 6,410,232 B1

MOLECULES OF THE FOLLISTATIN-RELATED PROTEIN FAMILY AND USES THEREOF

Douglas A. Holtzman, Cambridge, Mass., assignor to Millennium Pharmaceuticals, Inc., Cambridge, Mass.

Division of application No. 08/972,008, filed on Nov. 17, 1997, now Pat. No. 5,942,420. This application Mar. 12, 1999, Appl. No. 267,409.

Int. Cl. C12Q *1/68;* **C07H** *21/02*

U.S. Cl. 435—6 **61 Claims**

1. An isolated polypeptide comprising an amino acid sequence which is at least 55% identical to the amino acid sequence of SEQ ID NO:2 with or without the signal peptide or an amino acid sequence encoded by the nucleotide sequence of the DNA insert of the plasmid deposited with ATCC as Accession Number 98546.

US 6,410,233 B2

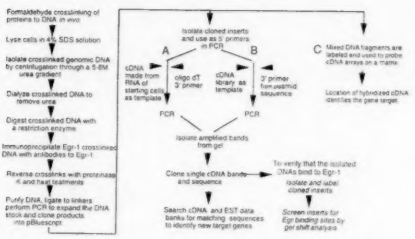
ISOLATION AND IDENTIFICATION OF CONTROL SEQUENCES AND GENES MODULATED BY TRANSCRIPTION FACTORS

Daniel Mercola; Eileen Adamson, both of P.O. Box 3752, Rancho Santa Fe, Calif. 92067, and Ian de Belle, 3158 Via Alicante, Apt. D, La Jolla, Calif. 92037

Filed Mar. 16, 1999, Appl. No. 270,391

Int. Cl. C12Q *1/68;* **G01N** *33/53;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **9 Claims**


Formaldehyde crosslinking of proteins to DNA in vivo
Lyse cells in 4% SDS solution
Isolate crosslinked genomic DNA by centrifugation through a 5-8M urea gradient
Dialyze crosslinked DNA to remove urea
Digest crosslinked DNA with a restriction enzyme
Immunoprecipitate Egr-1 crosslinked DNA with antibodies to Egr-1
Reverse crosslinks with proteinase K and heat treatments
Purify DNA, ligate to linkers perform PCR to expand the DNA stock and clone products into pBluescript
Isolate cloned inserts and use as 5' primers in PCR
A
B
C
Mixed DNA fragments are labeled and used to probe cDNA arrays on a matrix
cDNA made from RNA of starting cells as template
oligo dT 3' primer
cDNA library as template
3' primer from plasmid sequence
Location of hybridized cDNA identifies the gene target
PCR
PCR
Isolate amplified bands from gel
Clone single cDNA bands and sequence
To verify that the isolated DNAs bind to Egr-1 isolate and label cloned inserts
Search cDNA and EST data banks for matching sequences to identify new target genes
Screen inserts for Egr binding sites by gel shift analysis

1. A method for identifying one or more cDNA molecules that correspond to one or more genes regulated by a transcription factor, comprising:

a) cross-linking at least one transcription factor to at least one nucleic acid molecule in at least one cell or at least one nucleus, forming one or more transcription factor-nucleic acid molecule complexes;

b) fragmenting said at least one nucleic acid molecule to form one or more transcription factor-nucleic acid molecule fragment complexes;

c) isolating one or more nucleic acid molecule fragments from said one or more transcription factor-nucleic acid molecule fragment complexes to form one or more isolated nucleic acid molecule fragments;

d) combining said one or more isolated nucleic acid molecule fragments with either:

1) a nucleic acid sequence in a cDNA library of sequences known to be complementary to previously identified nucleic acid molecules, or

2) cDNA obtained by reverse transcription of a population of RNA molecules, to form a mixture comprising isolated nucleic acid molecule fragment/cDNA complexes;

e) amplifying one or more cDNAs in said isolated nucleic acid fragment/cDNA complexes using said one or more nucleic acid molecule fragments in said isolated nucleic acid fragment/cDNA complexes as primers to obtain one or more isolated cDNA molecules that correspond to one or more genes regulated by a transcription factor; and

f) identifying said one or more cDNA molecules that correspond to one or more genes regulated by a trascription factor by either:

1) sequencing said one or more cDNA molecules that correspond to one or more genes regulated by a transcription factor to obtain a sequence or sequences and comparing said sequence or sequences to the sequences of DNA molecules of known sequence to determine whether said one or more cDNA molecules has homology of greater than 70% with any of said sequences of DNA molecules of known sequence, or

2) hybridizing said one or more cDNA molecules that correspond to one or more genes regulated by a transcription factor to one or more nucleic acid molecules corresponding to known genes or nucleic acid sequences;

wherein the presence of a sequence or sequences having homology of greater than 70% or a hybridization results in the identification of said one or more cDNA molecules that correspond to one or more genes regulated by a transcription factor.

US 6,410,234 B2

Patent Not Issued For This Number

US 6,410,235 B1

DNA DETECTION BY MEANS OF A STRAND REASSOCIATION COMPLEX

Kurt Weindel, Wielenbach, and Joachim Brand, Peissenberg, both of Germany, assignors to Roche Diagnostics GmbH, Mannheim, Germany

Filed Jun. 4, 1999, Appl. No. 325,554

Claims priority, application Germany, Jun. 4, 1998, 198 24 900

Int. Cl. C12Q *1/68;* **C12P** *19/34;* **C12N** *9/44;* **C07H** *21/04*

U.S. Cl. 435—6 **12 Claims**

1. A method for the detection of a nucleic acid comprising the steps:

a) amplifying the nucleic acid or a part thereof in a reaction mixture with a first primer and a second primer, one of which can hybridize with one strand of the nucleic acid to be detected and the other of which can hybridize with a strand complementary thereto, wherein one of the primers contains a detectable label, to form a labeled extension product and an unlabeled extension product which are complementary to each other;

b) contacting a capture probe with the extension products to form a hybridization complex wherein the complex is necessarily a duplex; said hybridization complex comprising the capture probe, the labeled extension product and the unlabeled extension product, wherein the capture probe is selected such that the capture probe hybridizes to only the unlabeled extension product and only the unlabeled extension product hybridizes with the labeled extension product, further wherein a hybridization region formed between the capture probe and the unlabeled extension product is spatially separated from a hybridization region formed between the labeled extension product and the unlabeled extension product;

c) separating the hybridization complex from other components of the reaction mixture; and

d) determining the detectable label in the hybridization complex of step b).

US 6,410,236 B1

CORRECTING DIASTOLIC DYSFUNCTION IN HEART FAILURE

Joseph M. Metzger, Ann Arbor, Mich., assignor to The Regents of The University of Michigan, Ann Arbor, Mich.

Filed Sep. 1, 1999, Appl. No. 387,919

Int. Cl. C12Q *1/68*

U.S. Cl. 435—6 **3 Claims**

1. A method comprising:

a) providing:

i) a drug candidate and

ii) an in vitro cultured mammalian cardiac myocyte comprising an exogenous nucleic acid encoding a calcium binding protein operatively linked to a promotor;

b) exposing said in vitro cultured mammalian cardiac myocytes to said drug candidate; and

c) assaying the rate of relaxation of said in vitro cultured mammalian cardiac myocytes.

US 6,410,237 B1

DNA ENCODING CANINE VON WILLEBRAND FACTOR AND METHODS OF USE

George J. Brewer, Ann Arbor; Patrick J. Venta, Pinckney; Vilma Yuzbasiyan-Gurkan, Ann Arbor, and William D. Schall, Williamston, all of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, and The Regents of the University of Michigan, Ann Arbor, both of Mich.

Continuation of application No. 08/896,449, filed on Jul. 18, 1997, now Pat. No. 6,040,143. This application Nov. 2, 1999, Appl. No. 432,451.

Int. Cl. C12P *19/34;* **C12N** *1/20;5/00;* **C07H** *19/00;21/04*

U.S. Cl. 435—6 **15 Claims**

1. An isolated nucleic acid comprising a nucleotide sequence encoding the polypeptide of SEQ ID NO. 2, having a mutation at codon 85.

US 6,410,238 B1

BOX-DEPENDENT MYC-INTERACTING PROTEIN (BIN1) COMPOSITIONS AND USES THEREOF

George C. Prendergast, Bala Cynwyd, Pa., and Daitoku Sakamuro, West Lafayette, Ind., assignors to The Wistar Institute of Anatomy and Biology, Philadelphia, Pa.

PCT No. PCT/US98/11647, § 371 Date Dec. 3, 1999, § 102(e) Date Dec. 3, 1999, PCT Pub. No. WO98/55151, PCT Pub. Date Dec. 10, 1998

Continuation-in-part of application No. 08/870,126, filed on Jun. 6, 1997, now Pat. No. 6,048,702. This PCT application Jun. 4, 1998, Appl. No. 445,247.

Int. Cl. C12Q *1/68;* **C12N** *15/85;* **C07H** *21/04*

U.S. Cl. 435—6 **10 Claims**

1. A Bin1 brain-specific nucleic acid sequence selected from the group consisting of:

(a) Exon 12A SEQ ID NO: 15,

(b) Exon 12B SEQ ID NO: 17,

(c) Exon 12C SEQ ID NO: 19,

(d) Exon 12D SEQ ID NO: 21,

(e) intron sequences of SEQ ID NOS: 7 through 12,

(f) a sequence which hybridizes to any of the sequences of (a) through (e) under stringent conditions selected from the group consisting of:

i. hybridization at 2×SSC at 65° C., followed by a washing in 0.1×SSC at 65° C. for an hour;

ii. hybridization in 50% formamide, 4×SSC at 42° C.;

iii. hybridization in 4×SSC at 55° C., followed by washing in 0.1×SSC at 37° C. for an hour, and

iv. hybridization in 50% formamide, 4×SSC at 30° C.; and

(g) a fragment of any of (a) through (f) comprising at least 15 nucleic acids.

US 6,410,239 B1

IDENTIFICATION AND COMPARISON OF PROTEIN—PROTEIN INTERACTIONS THAT OCCUR IN POPULATIONS AND IDENTIFICATION OF INHIBITORS OF THESE INTERACTORS

Krishnan Nandabalan, Guilford; Jonathan Marc Rothberg, Woodbridge; Meijia Yang, East Lyme; James Robert Knight, and Theodore Samuel Kalbfleisch, both of Branford, all of Conn., assignors to CuraGen Corporation, New Haven, Conn.

Continuation of application No. 08/874,825, filed on Jun. 13, 1997, now Pat. No. 6,057,101, and a continuation-in-part of application No. 08/663,824, filed on Jun. 14, 1996, now Pat. No. 6,083,693. This application Dec. 14, 1999, Appl. No. 461,125.

This patent is subject to a terminal disclaimer.

Int. Cl. C12Q *1/68;* **C12P** *21/06*

U.S. Cl. 435—6 **17 Claims**

1. A method of detecting one or more protein-protein interactions comprising

(a) recombinantly expressing within a population of host cells

(i) a first population of first fusion proteins, each said first fusion protein comprising a first protein sequence and a DNA binding domain in which the DNA binding domain is the same in each said first fusion protein, and in which said first population of first fusion proteins has a complexity of at least 100; and

(ii) a second population of second fusion proteins, each said second fusion protein comprising a second protein sequence and a transcriptional regulatory domain of a transcriptional regulator, in which the transcriptional regulatory domain is the same in each said second fusion protein, such that a first fusion protein is co-expressed with a second fusion protein in host cells, and wherein said host cells contain at least one nucleotide sequence operably linked to a promoter driven by one or more DNA binding sites recognized by said DNA binding domain such that interaction of a first fusion protein with a second fusion protein results in regulation of transcription of said at least one nucleotide sequence by said regulatory domain, and in which said second population of second fusion proteins has a complexity of at least 100; wherein a host cell comprises a first fusion protein and a second fusion protein, and the number of host cells in the population is sufficiently large to provide confidence at the level of 50% or greater that every pair wise combination of a first fusion protein and a second fusion protein is represented in the population; and

(b) detecting said regulation of transcription of said at least one nucleotide sequence, thereby detecting cells in which an interaction between a first fusion protein and a second fusion protein has occurred.

US 6,410,240 B1

RGS-CONTAINING MOLECULES AND USES THEREOF

Martin R. Hodge, Arlington, and David Yowe, North Quincy, both of Mass., assignors to Millenium Pharmaceuticals, Inc., Cambridge, Mass.

Continuation-in-part of application No. 09/244,314, filed on Feb. 4, 1999, now Pat. No. 6,274,362. This application Feb. 4, 2000, Appl. No. 498,959.

Int. Cl. C12Q *1/68;* **G01N** *33/53;* **C07K** *14/00;* **C07H** *17/00*

U.S. Cl. 435—6 **50 Claims**

1. A method for identifying an agent that binds to a polypeptide selected from the group consisting of:

a) a polypeptide comprising the amino acid sequence of SEQ ID NO: 2 or SEQ ID NO: 4;

b) a polypeptide comprising an amino acid sequence encoded by the cDNA insert of the plasmid deposited with ATCC as Accession Number 207048; or

c) a polypeptide comprising an amino acid sequence encoded by the DNA sequence obtained from overlapping clones deposited with ATCC as Accession Numbers 207049 and 207050,

said method comprising the steps of;

a) combining an agent to be tested with a composition comprising said polypeptide under conditions suitable for binding; and

b) detecting the formation of a complex between said agent and said polypeptide. US 6,410,241 B1

METHODS OF SCREENING OPEN READING FRAMES TO DETERMINE WHETHER THEY ENCODE POLYPEPTIDES WITH AN ABILITY TO GENERATE AN IMMUNE RESPONSE

Kathryn F. Sykes, and Stephen Albert Johnston, both of Dallas, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Provisional application No. 60/125,864, filed on Mar. 24, 1999, Provisional application No. 60/127,222, filed on Mar. 31, 1999. This application Mar. 24, 2000, Appl. No. 535,366.

Int. Cl. C12Q *1/68*

U.S. Cl. 435—6 **28 Claims**

1. A method of screening at least one open reading frame to

determine whether it encodes a polypeptide with an ability to generate an immune response in an animal, comprising:

a) preparing in vitro at least one linear or circular expression element comprising an open reading frame linked to a promoter;

b) introducing the at least one linear or circular expression element into a cell within an animal without intervening cloning or bacterial propagation; and

c) assaying to determine whether an immune response is generated in the animal by expression of a polypeptide encoded by the open reading frame in the expression element.

US 6,410,242 B1
METHOD FOR PRESERVING THE UNIQUENESS AND IDENTITY OF AN INDIVIDUAL
Paul F. Lo Gerfo, 979 Rte. 9W, Grandview, N.Y. 10960-4907
Filed Jun. 30, 2000, Appl. No. 608,519
Int. Cl. C12Q *1/68*
U.S. Cl. 435—6 **29 Claims**

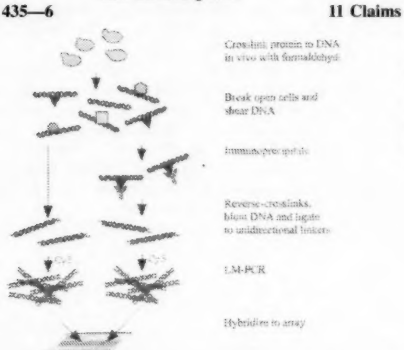
1. A DNA display device for preserving the uniqueness and identity of an organism comprising:

a substantially transparent capsule having a cavity formed therein;

a solution provided within the cavity; and,

DNA from the organism wherein the DNA is precipitated and suspended in the solution and visible to an unaided eye.

US 6,410,243 B1
CHROMOSOME-WIDE ANALYSIS OF PROTEIN-DNA INTERACTIONS
John Wyrick, Cambridge; Richard A. Young, Weston; Bing Ren, Somerville, and Francois Robert, Boston, all of Mass., assignors to Whitehead Institute for Biomedical Research, Cambridge, Mass.
Provisional application No. 60/151,972, filed on Sep. 1, 1999. This application Sep. 1, 2000, Appl. No. 654,409.
Int. Cl. C12Q *1/68*
U.S. Cl. 435—6 **11 Claims**


Crosslink protein to DNA in vivo with formaldehyde
Break open cells and shear DNA
Immunoprecipitate
Reverse-crosslinks, blunt DNA and ligate to unidirectional linkers
LM-PCR
Hybridize to array

1. A method of identifying a region of a genome of a living cell to which a protein of interest binds, comprising the steps of:

a) crosslinking DNA binding protein in the living cell to genomic DNA of the living cell, thereby producing DNA binding protein crosslinked to genomic DNA;

b) generating DNA fragments of the genomic DNA crosslinked to DNA binding protein in a), thereby producing a mixture comprising DNA fragments to which DNA binding protein is bound;

c) removing a DNA fragment to which the protein of interest is bound from the mixture produced in b);

d) separating the DNA fragment identified in c) from the protein of interest;

e) amplifying the DNA fragment of d);

f) combining the DNA fragment of e) with DNA comprising a sequence complementary to genomic DNA of the cell, under conditions in which hybridization between the DNA fragment and a region of the sequence complementary to genomic DNA occurs; and

g) identifying the region of the sequence complementary to genomic DNA of f) to which the DNA fragment hybridzes,

whereby the region identified in g) is the region of the genome in the cell to which the protein of interest binds.

US 6,410,244 B1
METHOD FOR PREPARING PLASMIDS, AND USES RELATED THERETO
Hong Wu Xu, Lexington, Mass., assignor to Curis, Inc., Cambridge, Mass.
Provisional application No. 60/162,993, filed on Nov. 1, 1999. This application Nov. 1, 2000, Appl. No. 704,230.
Int. Cl. C12Q *1/68;1/02;* **C12N** *15/63;1/02;1/21*
U.S. Cl. 435—6 **8 Claims**

1. A method for culturing a plasmid library, comprising

combining a plasmid library comprising a plurality of microorganisms, each expressing one of a plurality of plasmids, with a culture medium comprising a gelling agent,

dividing the culture medium between at least ten receptacles,

incubating the receptacles, and

separating the microorganisms from the culture medium.

US 6,410,245 B1
COMPOSITIONS AND METHODS FOR DETECTING LIGAND-DEPENDENT NUCLEAR RECEPTOR AND COACTIVATOR INTERACTIONS
Jeffrey P. Northrop, Redwood City; Charles P. Hart, and Peter J. Schatz, both of Mountain View, all of Calif., assignors to Affymax, Inc., Palo Alto, Calif.
Filed Apr. 1, 1998, Appl. No. 53,611
Int. Cl. G01N *33/53;33/566*
U.S. Cl. 435—7.1 **17 Claims**

1. A method for identifying nuclear receptor ligands comprising performing at least two different types of assays in multiplex format, said assays for identifying a ligand and/or quantifying the efficacy and/or potency of said ligand as an antagonist or agonist for a nuclear receptor and selected from the group of assays consisting of the following assay types (1) a positive hybrid system:coactivator assay, (2) a positive hybrid system:corepressor assay, (3) a reverse hybrid system:coactivator assay and (4) a reverse hybrid system:corepressor assay,

wherein

(a) the positive hybrid system:coactivator assay comprises

(i) contacting a first fusion protein, a second fusion protein, a first test compound and a first reporter construct that comprises a first regulatory sequence responsive to a first transcription factor and a first reporter sequence operably linked thereto, and wherein

the first fusion protein comprises a ligand binding domain (LBD) of the nuclear receptor linked to a transcriptional activation domain (AD) of the first transcription factor and the second fusion protein comprises a domain from a nuclear receptor coactivator protein (CA) and is linked to a DNA binding domain (DBD) of the first transcription factor, or

the first and second fusion protein are as described in section (a)(i), except that the LBD of the first fusion protein is fused to the DBD of the first transcription factor and the CA domain of the second fusion protein is fused to the AD of the first transcription factor, whereby

in the presence of agonist the first and second fusion proteins interact via the LBD and the CA domain to form a first reconstituted transcription factor that binds to the first regulatory sequence to activate transcription of the first reporter sequence; and

(ii) determining whether expression of the first reporter sequence is activated, activation being an indication that the first test agent is a ligand for the nuclear receptor and is an agonist rather than an antagonist;

(b) the positive hybrid system:corepressor assay comprises

(i) contacting a third fusion protein, a fourth fusion protein, a second test agent, and a second reporter construct that comprises a second regulatory sequence responsive to a second transcription factor and a second reporter sequence operably linked thereto, and wherein

the third fusion protein comprises the LBD linked to an AD from a second transcription factor and the fourth fusion protein comprises a domain from a nuclear corepressor protein (CR) linked to a DBD of the second transcription factor, or

the third and fourth fusion protein are as described in section (b) (i), except that the LBD of the third fusion protein is linked to the DBD of the second transcription factor and the CR domain of the fourth fusion protein is linked to the AD of the second transcription factor, whereby

in the presence of antagonist the third and fourth fusion proteins interact via the LBD and the CR domain to form a second reconstituted transcription factor that binds to the second regulatory sequence to activate transcription of the second reporter sequence; and

(ii) determining whether expression of the second reporter sequence is activated, activation being an indication that the second test agent is a ligand for the nuclear receptor and is an antagonist rather than an agonist;

(c) the reverse hybrid system:coactivator assay comprises

(i) contacting a fifth fusion protein, a sixth fusion protein, a third test agent, a third reporter construct encoding a third reporter, and a first relay construct responsive to a third transcription factor and encoding a first relay product that inhibits expression of the third reporter; and wherein

the fifth fusion protein comprises the LBD linked to an AD from the third transcription factor and the sixth fusion protein comprises the CA domain linked to the DBD of the third transcription factor, or

the fifth and sixth fusion protein are as described in section (c)(i), except that the LBD of the fifth fusion protein is linked to the DBD of the third transcription factor and the CA domain of the sixth fusion protein is linked to the AD from the third transcription factor, whereby

in the presence of antagonist, interaction between the fifth and sixth fusion protein via the LBD and the CA domain to form a third reconstituted transcription factor is inhibited, thereby inhibiting expression of the first relay product and thus activating expression of the third reporter; and

(ii) determining whether expression of the third reporter is activated, activation being an indication that the third test agent is a ligand for the nuclear receptor and is an antagonist rather than an agonist; and

(d) the reverse hybrid system:corepressor assay comprises

(i) contacting a seventh fusion protein, an eight fusion protein, a fourth test agent, a fourth reporter construct encoding a fourth reporter, and a second relay construct responsive to a fourth transcription factor and encoding a second relay product that inhibits expression of the fourth reporter; and wherein

the seventh fusion protein comprises the LBD linked to an AD from the fourth transcription factor and the eighth fusion protein comprises the CR domain linked to a DBD of the fourth transcription factor, or

the seventh and eighth fusion protein are as described in section (d)(i), except that the LBD of the seventh fusion domain is linked to the DBD of the fourth transcription factor and the CR domain of the eighth fusion protein is linked to the AD from the fourth transcription factor, whereby

in the presence of agonist, interaction between the seventh and eighth fusion protein via the LBD and the CR domain to form a fourth reconstituted transcription factor is inhibited, thereby inhibiting expression of the second relay product and activating expression of the fourth reporter; and

(ii) determining whether expression of the fourth reporter is activated, activation being an indication that the fourth test agent is a ligand for the nuclear receptor and is an agonist rather than an antagonist.

US 6,410,246 B1

HIGHLY DIVERSE LIBRARY OF YEAST EXPRESSION VECTORS

Li Zhu, Palo Alto, and Shaobing Benjamin Hua, Cupertino, both of Calif., assignors to Genetastix Corporation, San Jose, Calif.

Filed Jun. 23, 2000, Appl. No. 603,658
Int. Cl. G01N *33/53*
U.S. Cl. 435—7.1 **32 Claims**

1. A library of yeast expression vectors encoding a library of fusion proteins, each vector comprising:

a first nucleotide sequence encoding a first polypeptide subunit;

a second nucleotide sequence encoding a second polypeptide subunit; and

a linker sequence encoding a linker peptide that links the first nucleotide sequence and the second nucleotide sequence; wherein

the first polypeptide subunit, the second polypeptide subunit, and the linker polypeptide are expressed as a single fusion protein within the library of fusion proteins;

the first and second nucleotide sequences each independently varies within the library of expression vectors; and

the diversity of the library of fusion proteins is at least 1×10^7.

US 6,410,247 B1

NUCLEAR MATRIX PROTEIN FLUID ASSAY

Lee Anne Beausang, Norfolk; Graham P. Lidgard, Wellesley, and Thomas E. Miller, Franklin, all of Mass., assignors to Matritech, Inc., Newton, Mass.

Continuation of application No. 09/357,898, filed on Jul. 21, 1999, now Pat. No. 6,162,608, which is a continuation of application No. 08/456,620, filed on Jun. 1, 1995, now Pat. No. 5,989,826, which is a continuation of application No. 08/112,646, filed on Aug. 26, 1993, now abandoned, which is a continuation of application No. 07/785,804, filed on Oct. 31, 1991, now abandoned. This application Oct. 12, 2000, Appl. No. 687,188.

This patent is subject to a terminal disclaimer.
Int. Cl. G01N *33/53;33/567;33/574;33/531*
U.S. Cl. 435—7.1 **17 Claims**

1. A method for detecting the presence of a cancer in an individual, the method comprising the steps of:

(a) contacting a body fluid sample from the individual with a first binding partner and a second binding partner that bind specifically to a body fluid-soluble interior nuclear matrix protein, wherein the first binding partner is labeled with a detectable label and the second binding partner is immobilized on a solid support, such that the body fluid-soluble interior nuclear matrix protein, if present in the fluid sample, produces an amount of labeled complex immobilized on the solid support comprising the first binding partner, the body fluid-soluble interior nuclear matrix protein, and the second binding partner; and

(b) determining whether the amount of the labeled complex immobilized on the solid support is greater than a known standard, wherein an amount of labeled complex greater than the known standard is indicative of the presence of the cancer in the individual.

US 6,410,248 B1

GENERAL STRATEGY FOR SELECTING HIGH-AFFINITY ZINC FINGER PROTEINS FOR DIVERSE DNA TARGET SITES

Harvey A. Greisman, Brookline, and Carl O. Pabo, Newton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Provisional application No. 60/073,223, filed on Jan. 30, 1998. This application Jan. 29, 1999, Appl. No. 240,179.

Int. Cl. G01N *33/50;* **C12Q** *1/02*

U.S. Cl. 435—7.2 **15 Claims**

1. A method of making, in a context-dependent manner, a non-native zinc finger protein that binds to a selected target site comprising first, second and third target subsites, the method comprising the following steps carried out sequentially:

(i) identifying a first finger of the zinc finger protein by

(a) providing a first nucleic acid library encoding zinc finger proteins, wherein said zinc finger proteins comprise a first constant finger native that binds to a first known subsite, a second constant finger that binds to a second known subsite and a first randomized finger;

(b) expressing the zinc finger proteins encoded by the first nucleic acid library;

(c) providing a first target site comprising the first known subsite, the second known subsite and the selected target site, wherein the first known subsite is adjacent to the second known subsite and the second known subsite is adjacent to the first target subsite, and

(d) selecting a first zinc finger protein comprising the first constant finger, the second constant finger and a first selected finger, wherein the first and second constant fingers bind to the first and second known subsites, respectively, and the first selected finger binds to the first target subsite;

(ii) identifying a second finger of the zinc finger protein by

(a) providing a second nucleic acid library encoding zinc finger proteins, wherein the zinc finger proteins comprise the second constant finger, the first selected finger and a second randomized finger;

(b) expressing the zinc finger proteins encoded by the second nucleic acid library;

(c) providing a second target site comprising the second known subsite and the selected target site, wherein the second known subsite is adjacent to the selected target site; and

(d) selecting a second zinc finger protein comprising the second constant finger, the first selected finger and a second selected finger, wherein the second constant finger binds the second known subsite, the first selected finger binds the first target subsite and the second selected finger binds the second target subsite; and

(iii) identifying a third finger of the zinc finger protein by:

(a) providing a third nucleic acid library encoding zinc finger proteins, wherein the zinc finger proteins comprise the first selected finger, the second selected finger and a third randomized finger;

(b) expressing the zinc finger proteins encoded by the third nucleic acid library;

(c) providing a third target site comprising the selected target site, and

(d) selecting a third zinc finger protein comprising the first selected finger that binds to the first target subsite of the selected target site, the second selected finger that binds to the second target subsite of the target site, and a third selected finger that binds to the third target subsite of the selected target site,

thereby making, in a context-dependent manner, the zinc finger protein that binds to the selected target site.

US 6,410,249 B1

ODORANT RECEPTORS

John Ngai; David J. Speca; David M. Lin; Ehud Y. Isacoff; Andrew H. Dittman, and Jinhong Fan, all of Berkeley, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Provisional application No. 60/144,766, filed on Jul. 20, 1999. This application Jul. 19, 2000, Appl. No. 619,353.

Int. Cl. G01N *33/566;* **C07K** *1/00;* **C12N** *1/20;* **C12P** *21/06;* **C07H** *21/04*

U.S. Cl. 435—7.21 **18 Claims**

1. A method for detecting odorant receptor—ligand binding, said method comprising steps:

a) recombinantly expressing or isolating an odorant receptor comprising a ligand binding domain of a polypeptide consisting of SEQ ID NO:2;

b) incubating a mixture of the receptor and a ligand of the receptor; and

c) detecting specific binding of the receptor and the ligand.

US 6,410,250 B1

SUSTAINED DELIVERY DEVICE AND METHODS OF MAKING AND USING THE SAME

Frederico J. Gueiros-Filho, Boston; Stephen M. Beverley, Jamaica Plain, and Dennis E. Vaccaro, Wellesley, all of Mass., assignors to Symbiontics, Inc., Wellesley, Mass.

Continuation of application No. 08/735,507, filed on Oct. 23, 1996, now Pat. No. 6,020,144, Provisional application No. 60/026,006, filed on Sep. 12, 1996. This application Nov. 29, 1999, Appl. No. 451,245.

This patent is subject to a terminal disclaimer.

Int. Cl. G01N *33/53;33/569;* **C12N** *15/63;* **A61K** *39/002;* **C07H** *21/02*

U.S. Cl. 435—7.22 **6 Claims**

1. A method for producing an expression product in Leishmania, the method comprising the steps of:

transfecting a Leishmania organism with a nucleic acid comprising a nucleotide sequence encoding an expression product and a nucleotide sequence complementary to a wild type nucleotide sequence flanking a genetic locus in the genome of said organism; and,

selecting for a conditionally defective phenotype generated by loss of said genetic locus from said genome,

wherein the introduction of said nucleic acid into said organism results in the production of said expression product.

US 6,410,251 B2

METHOD FOR DETECTING OR ASSAYING TARGET SUBSTANCE BY UTILIZING OXYGEN ELECTRODE

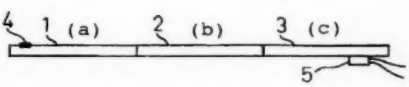
Fumihiko Hoshino; Osamu Asami; Hideo Nakane, and Yukio Yamada, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-gun, Japan

Filed Nov. 15, 1999, Appl. No. 440,585

Claims priority, application Japan, Nov. 18, 1998, 10-328403

Int. Cl. G01N *33/543*

U.S. Cl. 435—7.92 **25 Claims**



1. A method for detecting or assaying target substance A capable of specifically binding to specific substance B, comprising:

(1) feeding a sample solution expected to contain a target substance A to a porous support to allow the target substance A to react with a specific substance B labeled with a redox catalyst;

(2) allowing the sample solution from step (1) to migrate to a member composing a part of the porous support where a third substance A' capable of specifically binding to specific substance B is immobilized, thereby immobilizing the specific substance B in a free state;

(3) allowing the sample solution from step (2) to migrate to a sensing surface of an oxygen electrode in contact with a part of the porous support to bring the solution and a substrate of the redox catalyst into contact with the sensing surface of the oxygen electrode, and detecting or measuring an activity of the redox catalyst contained in the solution as a change of an electric current of the oxygen electrode due to consumption of the oxygen in the solution, wherein the area of the sensing surface of the oxygen electrode is 1 mm^2 or less, and the thickness of the member on the oxygen electrode is 0.1 to 5 mm; and

(4) detecting the presence or concentration of said target substance A based on the change of the electric current.

US 6,410,252 B1

METHODS FOR MEASURING T CELL CYTOKINES

Paul V. Lehmann; Alexey Karulin, both of Cleveland Heights; Richard Peter Trezza, Orange Village, and Thomas Forsthuber, University Heights, all of Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Filed Dec. 22, 1995, Appl. No. 577,957

Int. Cl. G01N *33/53;33/545;33/566;* **G06K** *9/82*

U.S. Cl. 435—7.94 **10 Claims**

1. A method of detecting secretion of a cytokine by T cells, comprising:

a) providing:

I) a microwell comprising a hydrophobic membrane comprising polyvinyl difluoride having a first binding ligand bound to said membrane, wherein said first binding ligand is specific for the cytokine;

ii) a primary cell population comprising T cells capable of secreting cytokines;

iii) a conjugate, free in solution, comprising an enzyme conjugated to a second binding ligand specific for the cytokine; and

iv) substrate for said enzyme;

b) adding said primary cell population to said microwell under conditions sufficient for said T cells to secrete cytokines, wherein said cytokine secreted by said T cells binds locally to said first binding ligand bound to said membrane adjacent locations of said T cells;

c) washing said microwell;

d) adding said conjugate to said microwell under conditions such that said second binding ligand binds specifically to said secreted cytokine bound to said first binding ligand;

e) washing said microwell;

f) adding said substrate to said microwell under conditions sufficient for an enzymatic color reaction to result from reaction of said substrate with said enzyme as an indication of presence, location, or amount of conjugate bound to said first binding ligand bound secreted cytokine; and

g) visualizing said enzymatic color reaction to detect presence, location, or amount of secretion of said cytokine by said T cells.

US 6,410,253 B1

CHOLESTEROL OXIDASE

Kinya Fujishiro, Shizuoka-ken, and Takayuki Uwajima, Machida, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Division of application No. 08/759,579, filed on Dec. 5, 1996, now Pat. No. 5,798,242, which is a division of application No. 08/460,114, filed on Jun. 2, 1995, now Pat. No. 5,665,560, which is a division of application No. 08/262,338, filed on Jun. 17, 1994, now Pat. No. 5,602,017, which is a continuation-in-part of application No. 08/014,531, filed on Feb. 8, 1993, now Pat. No. 5,371,005, which is a continuation of application No. 07/798,660, filed on Nov. 26, 1991, now abandoned, which is a continuation-in-part of application No. 07/683,539, filed on Apr. 10, 1991, now abandoned. This application Aug. 14, 1998, Appl. No. 133,966.

Claims priority, application Japan, Apr. 10, 1990, 9-094296

This patent is subject to a terminal disclaimer.

Int. Cl. C12Q *1/60;* **C12N** *9/04;9/08;15/53*

U.S. Cl. 435—11 **4 Claims**

1. A method for quantitative determination of cholesterol contained in a sample which comprises;

exposing the sample to a cholesterol oxidase to oxidize the cholesterol, and

measuring the amount of oxidized cholesterol or hydrogen peroxide thereby determining the amount of the cholesterol,

wherein the cholesterol oxidase is coded by DNA which is hybridizable to DNA as defined in SEQ ID: NO:1, under stringent conditions, wherein said stringent conditions comprise hybridization at 45° C. in a hybridization buffer containing 53.0 g/l NaCl, 26.5 g/l sodium succinate, 10 mM EDTA, 5-fold Denhart solution, 0.5% SDS, 0.1 mg/ml thermally denatured bovine thymus-derived DNA for 16 hours and washing at 65° C. with 3-fold SSC.

US 6,410,254 B1

COMPOSITIONS AND ASSAYS UTILIZING ADP OR PHOSPHATE FOR DETECTING PROTEIN MODULATORS

Jeffrey T. Finer, Foster City; Fady Malik, Burlingame; Roman Sakowicz, Foster City; Christopher Shumate, San Francisco, and Kenneth Wood, Foster City, all of Calif., assignors to Cytokinetics, South San Francisco, Calif.

Filed May 18, 1999, Appl. No. 314,464

Int. Cl. C12Q *1/42;1/48;1/52;1/50;* **C12N** *9/18*

U.S. Cl. 435—21 **38 Claims**

1. A high throughput assay method for rapidly identifying a compound that modulates function of a target protein wherein said target protein produces ADP or phosphate and said method comprises:

a) adding a compound to a mixture comprising a target protein which produces ADP or phosphate under conditions which normally allow the production of ADP or phosphate;

b) subjecting the mixture to an enzymatic reaction, wherein said enzymatic reaction uses ADP or phosphate as a substrate under conditions which normally allow the ADP or phosphate to be utilized; and

c) determining NADH consumption as a measure of ADP production; wherein a change in measure of NADH consumption between the presence and absence of said compound indicates that said compound is a modulator of said target protein,

wherein up to about 10,000 assays can be performed per hour; the assays are performed in microtiter plates having 96 wells or more; and the assay mixture further comprises a surfactant or antifoam.

US 6,410,255 B1
OPTICAL PROBES AND ASSAYS

Brian A. Pollok, San Diego; Brian D. Hamman; Steven M. Rodems, both of Poway, and Lewis R. Makings, Encinitas, all of Calif., assignors to Aurora Biosciences Corporation, San Diego, Calif.

Filed May 5, 1999, Appl. No. 306,542
Int. Cl. C12Q *1/37;1/42*
U.S. Cl. 435—23 **31 Claims**

1. A method for measuring a post-translational modification activity, comprising:

a) contacting a sample with an engineered optical probe, said engineered optical probe comprising:

a polypeptide comprising a first probe moiety,

wherein said polypeptide comprises a recognition motif for a post-translational type modification within said polypeptide, and a protease site located within said polypeptide; and

wherein post-translational type modification of said recognition motif modulates the rate of cleavage of said polypeptide by a protease with specificity for said protease site,

b) contacting said sample and said engineered optical probe with a protease with specificity for said protease site, and

c) detecting a change in at least one optical property of said engineered optical probe.

US 6,410,256 B1
METHOD OF MAKING BIOFILMS

Howard Ceri; Merle Edwin Olson, both of Calgary; Douglas Walter Morck, Airdrie; Ronald Rae Read, and Andre Gerald Buret, both of Calgary, all of Canada, assignors to University Technologies International Inc., Alberta, Canada

PCT No. PCT/CA97/00171, § 371 Date Jul. 19, 2000, § 102(e) Date Jul. 19, 2000, PCT Pub. No. WO97/33972, PCT Pub. Date Sep. 18, 1997
PCT Filed Mar. 12, 1997, Appl. No. 380,714
Int. Cl. C12Q *1/02*
U.S. Cl. 435—29 **10 Claims**

1. A method of making a plurality of biofilms, the method comprising the steps of:

providing a vessel with a plurality of recesses and a cover of the vessel having a plurality of protruding biofilm adherent sites;

providing a flowing liquid growth medium in the recesses of the vessel; and

incubating biofilm forming organisms on the biofilm adherent sites while flowing the liquid growth medium across the biofilm adherent sites so as to form a biofilm on each of the biofilm adherent sites.

US 6,410,257 B1
METHODS TO ASSAY GENE FUNCTION WITH VIRAL VECTORS

Boro Dropulic, Ellicott City, and Paula Pitha-Rowe, Baltimore, both of Md., assignors to The Johns Hopkins University School of Medicine, Baltimore, Md.

Division of application No. 09/251,085, filed on Feb. 16, 1999, now Pat. No. 6,114,141, which is a continuation of application No. 08/917,625, filed on Aug. 22, 1997, now Pat. No. 5,888,767, which is a division of application No. 08/758,598, filed on Nov. 27, 1996, now Pat. No. 5,885,806, Provisional application No. 60/032,800, filed on Nov. 28, 1995. This application May 1, 2000, Appl. No. 562,894.
Int. Cl. C12N *15/09;15/79;15/86;15/867;* **C07H** *21/00*
U.S. Cl. 435—29 **51 Claims**

1. A method of determining the functional properties of a cellular gene product, which method comprises:

a) contacting a host cell with a vector comprising at least a first and second nucleotide sequences wherein:

(i) said first nucleotide sequence comprises or encodes, in which case it also expresses, a ribozyme capable of cleaving native RNA encoding said cellular gene product;

(ii) the vector replicates in said host cell only upon complementation with a helper virus or a helper vector;

(iii) the vector is selectively replicated over said helper virus or helper vector; and

(iv) genetic recombination between said vector and said helper virus or helper vector is reduced by the presence of said second nucleotide sequence;

b) expressing said first nucleotide sequence in the host cell; and

c) determining the functional properties of the cellular gene product.

US 6,410,258 B1
MOLECULAR HYDROGEN PRODUCTION BY DIRECT ELECTRON TRANSFER

Hugh McTavish, 1215 Englewood Ave., St. Paul, Minn. 55104

Filed Jun. 20, 1997, Appl. No. 879,920
Int. Cl. C12P *3/00*
U.S. Cl. 435—41 **18 Claims**

1. A method for producing molecular hydrogen comprising combining: (a) photosystem I complex from a photosynthetic organism, (b) at least one hydrogenase enzyme which catalyzes the production of molecular hydrogen, and (c) an electron donor which donates electrons to photosystem I,

wherein molecular hydrogen production occurs by direct electron transfer from the photosystem I complex to the hydrogenase.

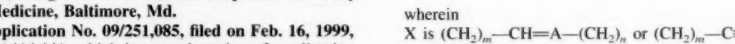
US 6,410,259 B1
PROCESS FOR THE FERMENTATIVE PRODUCTION OF DEACYLATED CEPHALOSPORINS

Maarten Nieboer, Berkel en Rodenrijs; Erik De Vroom, Leiden; Johannis Lugtenburg, Oegstgeest; Dirk Schipper, Delft; Adrianus Wilhelmus Hermanus Vollebregt, Naaldwijk, and Roelof Ary Lans Bovenberg, Rotterdam, all of Netherlands, assignors to DSM Patents & Trademarks, Ma Delft, Netherlands

PCT No. PCT/EP98/02461, § 371 Date Aug. 26, 1999, § 102(e) Date Aug. 26, 1999, PCT Pub. No. WO98/48035, PCT Pub. Date Oct. 29, 1998
PCT Filed Apr. 22, 1998, Appl. No. 202,797
Claims priority, application European Pat. Off., Apr. 22, 1997, 97201197
Int. Cl. C12P *35/00;35/06;* **C12N** *9/00;9/88;* **C07H** *21/04*
U.S. Cl. 435—47 **9 Claims**

1. A process for the production of an N-deacylated cephalosporin compound comprising the steps of:

(a) fermenting a microbial strain capable of β-lactam production and expressing acyltransferase as well as expandase activity, and optionally acetyltransferase and/or hydroxylase activity, in the presence of a side chain precursor according to formula (1)



HOOC—X—COOH (1)

wherein

X is $(CH_2)_m$—CH=A—$(CH_2)_n$ or $(CH_2)_m$—C≡C—$(CH_2)_n$, wherein

m and n each individually are 0, 1, 2 or 3 and m+n= 2 or 3, and

A is CH or N, or

X is $(CH_2)_p$—CH=CH—CH=C—$(CH_2)_q$, wherein

p and q each individually are 0 or 1 and p+q =0 or 1,

or a salt, ester or amide thereof, said side chain precursor yielding an acyl-6-APA derivative incorporating said precursor, said acyl-6-APA derivative being in situ expanded to the corresponding acyl-7-ADCA derivative, optionally further reacted to the acyl-7-ADAC or acyl-7-ACA derivative, and

(b) recovering the acyl-7-cephalosporin derivative from the fermentation broth

(c) deacylating said acyl-7-cephalosporin derivative, and

(d) recovering the crystalline N-deacylated cephalosporin compound.

US 6,410,260 B2

FIBRIN GLUE WITHOUT FIBRINOGEN AND BIOSEALANT COMPOSITIONS AND METHODS

Leon Wortham, 5721 Vincent Rd., Chattanooga, Tenn. 37416

Division of application No. 09/159,736, filed on Sep. 24, 1998, now Pat. No. 6,168,788, Provisional application No. 60/064,864, filed on Sep. 26, 1997. This application Dec. 14, 2000, Appl. No. 737,146.

Int. Cl. C12P *21/06*

U.S. Cl. 435—68.1 **18 Claims**

1. A method of manufacturing a fibrin glue without fibrinogen comprising:

a) isolating prothrombin from blood,

b) converting the isolated prothrombin to thrombin,

c) isolating thromboplastin from blood, and

d) blending the products of step a) or b) and step c) plus calcium in a pharmaceutically acceptable carrier to produce the fibrin glue without fibrinogen.

US 6,410,261 B2

CIITA-INTERACTING PROTEINS AND METHODS OF USE THEREFOR

Laurie H. Glimcher, West Newton, Mass., and Hong Zhou, Wilmington, Del., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Nov. 6, 1997, Appl. No. 965,272

Int. Cl. C07H *21/02;* **C12N** *15/00;* **C12P** *21/06;* **C07K** *1/00*

U.S. Cl. 435—69.1 **8 Claims**

1. An isolated nucleic acid molecule comprising the coding region (positions 509–3343) of the nucleotide sequence of SEQ ID NO: 1.

US 6,410,262 B1

SECRETION FACTORS FOR GRAM-POSITIVE MICROORGANISMS GENES ENCODING THEM AND METHODS OF USING IT

Wilhelmus J. Quax, Voorschoten; Richard Kerkman, Zandvoort, and Cornelis P. Broekhuizen, Rijswijk, all of Netherlands, assignors to Genencor International, Inc., Palo Alto, Calif.

PCT No. PCT/NL96/00278, § 371 Date Dec. 16, 1997, § 102(e) Date Dec. 16, 1997, PCT Pub. No. WO97/03197, PCT Pub. Date Jan. 30, 1997

PCT Filed Jul. 5, 1996, Appl. No. 981,527

Claims priority, application European Pat. Off., Jul. 7, 1995, 95201871

Int. Cl. C12P *21/06;* **C12N** *1/21;* **C07K** *14/32;* **C07H** *21/04*

U.S. Cl. 435—69.1 **25 Claims**

1. An isolated protein having the amino acid sequence of SEQ ID NO:8.

US 6,410,263 B1

HISTIDINE KINASE

Nicola Gail Wallis, Wayne; Lisa Kathleen Shilling, Newtown, and Richard Lloyd Warren, Blue Bell, all of Pa., assignors to Smithkline Beecham Corporation, Philadelphia, Pa., and Smithkline Beecham p.l.c., Brentford, United Kingdom

Provisional application No. 60/037,856, filed on Feb. 7, 1997. This application Jan. 29, 1998, Appl. No. 15,189.

Int. Cl. C07H *21/04;* **C12P** *21/06;* **C12N** *9/12;1/14;15/00*

U.S. Cl. 435—69.1 **14 Claims**

1. An isolated polynucleotide segment comprising a first polynucleotides sequence or the full complement of the entire length of the first polynucleotide sequence, wherein the first polynucleotide sequence comprises nucleotides 227 to 1258 of SEQ ID NO:1; wherein the first polynucleotide sequence or the full complement of the entire length thereof is not genomic DNA.

US 6,410,264 B1

***PICHIA PASTORIS* GENE SEQUENCES AND METHODS FOR THEIR USE**

Kenneth A. Crawford, Alameda, and Robert Bishop, San Francisco, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Provisional application No. 60/054,783, filed on Aug. 5, 1997, Provisional application No. 60/069,560, filed on Dec. 12, 1997. This application Jul. 31, 1998, Appl. No. 127,578.

Int. Cl. C12Q *1/68*

U.S. Cl. 435—69.1 **73 Claims**

1. A recombinant construct comprising in proper reading frame a nucleotide sequence for a promoter and a nucleotide sequence encoding a polypeptide, where said promoter drives transcription of an operably linked nucleotide sequence of interest, wherein said nucleotide sequence for said promoter is selected from the group consisting of:

a) the nucleotide sequence set forth in SEQ ID NO: 2; b) a nucleotide sequence having at least 70% sequence identity to the nucleotide sequence set forth in SEQ ID NO: 2;

c) a nucleotide sequence comprising at least 24 contiguous nucleotides of the sequence set forth in SEQ ID NO: 2; and

d) a nucleotide sequence that hybridizes to any one of a), b), or c) under conditions of high stringency.

US 6,410,265 B1

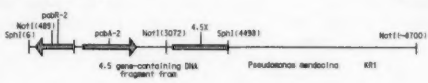
GENE ENCODING A PUTIVE EFFLUX PROTEIN FOR SOLVENTS/ANTIBIOTICS IN *PSEUDOMONAS MENDOCINA*

Kevin Keqin Chen, Beijing, China, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of application No. 08/961,738, filed on Oct. 31, 1997, now abandoned. This application Oct. 30, 1998, Appl. No. 183,270.

Int. Cl. G01N *33/00;* **C12P** *21/06;7/44;* **C12Q** *1/68;* **C12N** *1/20;* **C07H** *21/02*

U.S. Cl. 435—69.1 **4 Claims**



1. A method for the efficient production of p-hydroxybenzoic acid comprising:

(a) culturing a Pseudomonas strain having a toluene monooxygenase pathway for toluene oxidation and having an efflux gene encoding an efflux protein at increased levels relative to efflux protein levels of the wildtype microorganism, the efflux protein encoded by an isolated nucleic acid molecule from Pseudomonas selected from the group consisting of:

(i) an isolated nucleic acid molecule encoding the amino acid sequence set forth in SEQ ID NO:2;

(ii) an isolated nucleic acid molecule that hybridizes to the complement of the isolated nucleic acid molecule of (i) under the following hybridization conditions: 0.1×SSC, 0.1% SDS at 65° C.; and washed with 2×SSC, 0.1% SDS followed by a second wash in 0.2×SSC, 0 1% SDS; and

(iii) an isolated nucleic acid molecule that is complementary to the full length of (i) or (ii),

in a medium containing an aromatic organic substrate, at least one suitable carbon source, and a nitrogen source, whereby p-hydroxybenzoic acid accumulates; and

(b) recovering p-hydroxybenzoic acid.

US 6,410,266 B1

COMPOSITIONS AND METHODS FOR NON-TARGETED ACTIVATION OF ENDOGENOUS GENES

John J. Harrington, Mentor, and Stephen Rundlett, Chagrin Falls, both of Ohio, assignors to Athersys, Inc., Cleveland, Ohio

Division of application No. 09/276,820, filed on Mar. 26, 1999, which is a continuation-in-part of application No. 09/263,814, filed on Mar. 8, 1999, now abandoned, which is a continuation-in-part of application No. 09/253,022, filed on Feb. 19, 1999, now abandoned, which is a continuation-in-part of application No. 09/159,643, filed on Sep. 24, 1998, now abandoned, which is a continuation-in-part of application No. 08/941,223, filed on Sep. 26, 1997, now abandoned. This application Jan. 7, 2000, Appl. No. 479,122.

Int. Cl. C12N *15/63;15/85;* **C12Q** *1/68*

U.S. Cl. 435—69.1 **49 Claims**

9. A method for producing an expression product of an endogenous cellular gene or portion thereof comprising:

(a) introducing into a eukaryotic cell in vitro a vector construct comprising a transcriptional regulatory sequence that is operably linked to an exon comprising a translational start codon, a secretion signal sequence, and an epitope tag sequence, said exon defined at the 3' end by an unpaired splice donor site;

(b) maintaining said cell under conditions suitable for integrating said vector construct into the genome of said cell by non-homologous recombination such that the transcriptional regulatory sequence is operably linked to said endogenous cellular gene; and

(c) maintaining said cell produced in step (b) under conditions suitable for over-expressing, by means of said integrated transcriptional regulatory sequence, said endogenous cellular gene or portion thereof in said cell thereby producing said expression product.

US 6,410,267 B1

HUMAN GTPASE-ASSOCIATED PROTEINS

Olga Bandman, Mountain View; Preeti Lal, Santa Clara; Karl J. Guegler, Menlo Park; Neil C. Corley, and Chandra Patterson, both of Mountain View, all of Calif., assignors to Incyte Genomics, Inc., Palo Alto, Calif.

Division of application No. 09/063,743, filed on Apr. 21, 1998, now Pat. No. 6,242,214. This application Jun. 8, 2000, Appl. No. 590,540.

Int. Cl. C12P *21/06;* **C07H** *17/00;* **C07K** *14/00*

U.S. Cl. 435—69.1 **12 Claims**

1. An isolated polynucleotide molecule encoding a GTPase-associated polypeptide (GPAP), where said polypeptide is selected from the group consisting of:

a) the amino acid sequence of SEQ ID NO:3 and

b) a naturally-occurring amino acid sequence having at least 90% sequence identity to the amino acid sequence of SEQ ID NO: 3 and having the ability to interact with GTPase-deficient mutant Rab5 protein RabQ79L, and

c) antigenically active fragments of SEQ ID NO:3.

US 6,410,268 B1

POLYNUCLEOTIDES ENCODING CHEMOKINE ALPHA-3

Jian Ni, Rockville; Haodong Li, and Jeffrey Su, both of Gaithersburg, all of Md., assignors to Human Genome Sciences, Inc., Rockville, Md.

Provisional application No. 60/013,615, filed on Mar. 18, 1996. This application Mar. 18, 1997, Appl. No. 816,772.

Int. Cl. C12N *1/20;5/00;15/00;* **C07H** *21/00*

U.S. Cl. 435—69.5 **19 Claims**

1. An isolated nucleic acid molecule comprising a polynucleotide selected from the group consisting of:

(a) a polynucleotide encoding amino acids −37 to 76 in SEQ ID NO:2;

(b) a polynucleotide encoding amino acids −36 to 76 in SEQ ID NO:2;

(c) a polynucleotide encoding amino acids 1 to 76 in SEQ ID NO:2;

(d) a polynucleotide encoding the chemokine α-3 polypeptide as encoded by the cDNA clone contained in ATCC Deposit No. 97404;

(e) a polynucleotide encoding the mature chemokine α-3 polypeptide as encoded by the cDNA clone contained in ATCC Deposit No. 97404;

(f) a polynucleotide encoding at least 75 contiguous amino acids of SEQ ID NO:2; and

(g) the complement of (a), (b), (c), (d), (e), or (f).

US 6,410,269 B1

PREPARATION OF POTENT MACROPHAGE ACTIVATING FACTORS DERIVED FROM CLONED VITAMIN D BINDING PROTEIN AND ITS DOMAIN AND THEIR THERAPEUTIC USAGE FOR CANCER, HIV-INFECTION AND OSTEOPETROSIS

Nobuto Yamamoto, 1040 66th Ave., Philadelphia, Pa. 19126

Continuation-in-part of application No. 08/478,121, filed on Jun. 7, 1995, now Pat. No. 5,620,846. This application Mar. 19, 1996, Appl. No. 618,485.

Int. Cl. C12P *21/00;* **C12N** *15/00;* **C07K** *14/46*

U.S. Cl. 435—69.6 **6 Claims**

1. A process for cloning vitamin D_3-binding protein domain III (Gc domain III) into baculovirus comprising the step of selecting and utilizing a baculovirus vector to clone the vitamin D_3-binding protein domain III (Gc domain III).

US 6,410,270 B1

PROCESS FOR THE PREPARATION OF RECOMBINANT PROTEINS IN *E. COLI* BY HIGH CELL DENSITY FERMENTATION

Wolfgang Strittmatter, Ober-Ramstadt; Siegfried Matzku, Zwingenberg; Dieter Riesenberg, Jena; Uwe Horn, Bad Frankenhausen; Uwe Knüpeer, Jena; Marian Kujau, Jena; Rolf Wenderoth, Jena, all of Germany; Andreas Plückthun, Zürich, and Anke Krebber, Zürich, both of Switzerland, assignors to Merck Patent Gesellschaft, Darmstadt, Germany

PCT No. PCT/EP96/05260, § 371 Date Nov. 16, 1998, § 102(e) Date Nov. 16, 1998, PCT Pub. No. WO97/21829, PCT Pub. Date Jun. 19, 1997

PCT Filed Nov. 28, 1996, Appl. No. 77,549

Claims priority, application European Pat. Off., Dec. 11, 1995, 95119478

Int. Cl. C12N *15/00;15/63;1/21;* **C12P** *21/00;* **C07H** *21/04*

U.S. Cl. 435—69.6 **30 Claims**

1. A high density fermentation process for producing a foreign protein from *E. coli* cells which have been transformed with a plasmid carrying an inducible promoter and, regulated by that promoter, a nucleic acid which encodes the protein, wherein there is no restriction of cell growth by substrates or metabolic by-products, comprising

a) culturing the cells under batch fermentation conditions, then

b) performing a fed-batch step, wherein the concentration of the carbon source in the medium is kept in a range from 0.1 g/l to 25 g/l while maintaining unlimited growth of the cells, and the pO_2 is adjusted to between 5 and 25% by passing oxygen into the fermentation broth, which comprises

i) inducing the promoter at a cell density of between 10 and 80 g/l, thereby initiating the production of the foreign protein, and then

ii) continuously feeding in utilizable nitrogen, phosphate, and salts of trace elements.

US 6,410,271 B1

GENERATION OF HIGHLY DIVERSE LIBRARY OF EXPRESSION VECTORS VIA HOMOLOGOUS RECOMBINATION IN YEAST

Li Zhu, Palo Alto, and Shaobing Benjamin Hua, Cupertino, both of Calif., assignors to GeneTasTix Corporation, San Jose, Calif.

Filed Jun. 23, 2000, Appl. No. 602,373

Int. Cl. C12P *21/04;21/06;* **C12N** *15/74;33/53*

U.S. Cl. 435—69.7 **25 Claims**

1. A method for generating a library of yeast expression vectors, comprising:

transforming into yeast cells

a linearized yeast expression vector having a 5'- and 3'-terminus sequence at the site of linearization, and

a library of insert nucleotide sequences that are linear and double-stranded, each insert sequence comprising

a first nucleotide sequence encoding an antibody heavy chain variable region,

a second nucleotide sequence encoding an antibody light chain variable region,

a linker sequence encoding a linker peptide that links the antibody heavy chain variable region and,the an antibody light chain variable region, and

5'- and 3'-flanking sequences at the ends of the insert sequence which are sufficiently homologous to the 5'- and 3'-terminus sequences of the linearized yeast expression vector, respectively, to enable homologous recombination to occur; and

having homologous recombination occur between the linearized yeast expression vector and the library of insert sequences to form a library of yeast expression vectors comprising the insert sequences in the transformed yeast cells;

wherein

the antibody heavy chain variable region, the antibody light chain variable region, and the linker polypeptide are expressed as a single fusion protein in the transformed yeast cells by the library of yeast expression vectors;

the first and second nucleotide sequences of the insert sequences each independently varies within the library of yeast expression vectors; and

the diversity of the insert sequences comprised in the library of yeast expression vectors is at least 1×10^7.

US 6,410,272 B1

PRODUCTION OF THROMBIN INHIBITORS

Bernd Meyhack, Magden; Walter Märki, Möhlin, and Jutta Heim, Pratteln, all of Switzerland, assignors to Ciba-Geigy Corporation a Corp. of New York, Ardsley, N.Y.

Continuation of application No. 06/938,102, filed on Dec. 4, 1986, now abandoned. This application Feb. 27, 1990, Appl. No. 488,513.

Claims priority, application United Kingdom, Dec. 12, 1985, 85 30631; May 29, 1986, 86 13088

Int. Cl. C12P *21/04*

U.S. Cl. 435—71.1 **14 Claims**

1. A method for the production of desulphatohirudin compounds with hirudin activity comprising the steps of:

(a) culturing under appropriate nutrent conditions yeast cells transformed with a hybrid vector, the hybrid vector comprising:

one to four DNA inserts each comprising a yeast promoter selected from the group consisting of a PHO5 promoter, a GAPDH promoter, or a functional fragment thereof, and a hybrid promoter comprising upstream activation sequences of the PHO5 gene and downstream promoter elements including a functional TATA box of the GAPDH gene,

a DNA segment consisting of a first DNA sequence encoding the PHO5 or invertase signal peptide upstream of and in reading frame with a second DNA sequence coding for mature desulphatohirudin wherein the DNA segment is under transcriptional control of the yeast promoter, and a DNA sequence containing eukaryotic transcription termination signals,

and a selective gene marker,

wherein about 90 percent or more of the desulphatohirudin compounds are secreted into the culture medium as measured by high pressure liquid chromatography, and

(b) isolating the proteins with hirudin activity from the culture medium.

US 6,410,273 B1

METHOD FOR PRODUCING METHYLATED DNA

Joël Crouzet, Sceaux, and Béatrice Cameron, Paris, both of France, assignors to Aventis Pharma S.A., Antony, France

PCT No. PCT/FR97/01116, § 371 Date Nov. 12, 1998, § 102(e) Date Nov. 12, 1998, PCT Pub. No. WO98/01540, PCT Pub. Date Jan. 15, 1998

PCT Filed Jun. 24, 1997, Appl. No. 202,314

Claims priority, application France, Jul. 4, 1996, 96 08327

Int. Cl. C12N *15/00;15/63;* **C12P** *19/34;* **C07H** *21/02;21/04*

U.S. Cl. 435—91.1 **15 Claims**

1. A method for the production of a methylated DNA selected from the group consisting of a plasmid DNA and a minicircle, wherein the method comprises transforming a prokaryotic cell with the DNA to be methylated and an expression cassette comprising a nucleic acid encoding a bacterial DNA methyltransferase, wherein the expression cassette is introduced into the prokaryotic cell before, after, or at the same time as the DNA to be methylated, culturing the transformed prokaryotic cell under conditions that permit expression of the bacterial DNA methyltransferase, whereby cytosine residues of 5'-CG-3' dinucleotides of the DNA to be methylated are methylated, and purifying the methylated DNA from the prokaryotic cell.

US 6,410,274 B1

PLASMID DNA PURIFICATION USING DIVALENT ALKALINE EARTH METAL IONS AND TWO ANION EXCHANGERS

Ramagauri Bhikhabhai, Uppsala, Sweden, assignor to Amersham Pharmacia Biotech AB, Uppsala, Sweden

PCT No. PCT/SE98/01672, § 371 Date Oct. 7, 1999, § 102(e) Date Oct. 7, 1999, PCT Pub. No. WO99/16869, PCT Pub. Date Apr. 8, 1999

PCT Filed Sep. 28, 1998, Appl. No. 319,212

Claims priority, application Sweden, Sep. 30, 1997, 9703532

Int. Cl. C12P *19/34;* **C12N** *11/00;* **C07H** *21/00*

U.S. Cl. 435—91.1 **10 Claims**

1. A process for purification of plasmid DNA by separation on an insoluble matrix comprising the following steps:

a) lysing cells containing said plasmid DNA to obtain a lysate comprising plasmid DNA, chromosomal DNA and RNA;

b) precipitating most of the RNA and most of the chromosomal DNA in the lysate by adding divalent alkaline earth metal ions to the lysate from step a);

c) removing the precipitated RNA and chromosomal DNA from the lysate from step b);

d) contacting the lysate from step c) with an anion exchange matrix containing anion exchange groups to obtain purified plasmid DNA; and

e) contacting the purified plasmid DNA from step d) with an anion exchange matrix different from the anion exchange matrix of step d) to obtain purified plasmid DNA of gene therapy grade.

US 6,410,275 B1

DISPOSABLE TEST DEVICES FOR PERFORMING NUCLEIC ACID AMPLIFICATION REACTIONS

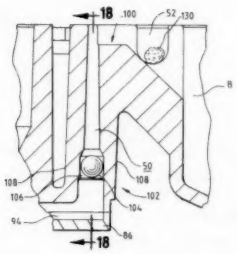
Bryan Kluttz, Norwell; Lawrence Burg, Framingham, both of Mass.; Garry Tegeler, Hazelwood, Mo.; Louis Graziano, Rockland, Mass.; Christopher Cotter, Charlestown, Mass.; Michel Guy, Scituate, Mass.; James Greer, Rockland, Mass.; Geoff McKinley; Luigi Catanzariti, both of Duxbury, Mass.; Robert Glassfold, West Warwick, R.I.; James Clement Bishop, Columbia, Mo.; Bruno Colin, Marcy l'Etoile, France; Cécile Paris, Lyons, France; Thomas Wang, Lexington, and Michael Morin, Dedham, both of Mass., assignors to bioMerieux, Inc., Hazelwood, Mo.

Continuation-in-part of application No. 09/053,823, filed on Apr. 2, 1998, now Pat. No. 5,989,499, which is a continuation-in-part of application No. 08/850,207, filed on May 2, 1997, now Pat. No. 5,786,182. This application Oct. 18, 1999, Appl. No. 420,139.

This patent is subject to a terminal disclaimer.

Int. Cl. C12P *19/34;* **C12M** *3/00;* **G01N** *21/00;* **C12N** *15/00*

U.S. Cl. 435—91.1 **37 Claims**



1. A test device for performing a nucleic acid amplification reaction, comprising:

a housing having a first end and a second end, said housing having a portion thereof defining a plurality of wells between said first and second ends;

said housing further comprising a dual chamber reaction vessel for a nucleic acid amplification reaction to be carried out therein, said dual chamber reaction vessel comprising a first chamber in which a first portion of a nucleic acid amplification reaction is performed, a second chamber in which a second portion of a nucleic acid amplification reaction is performed, an openable connecting conduit linking said first chamber to said second chamber and an externally actuated valve disposed in said openable connecting conduit, wherein an actuation of said valve opens said connecting conduit and allows fluid to flow through said connecting conduit from said first chamber to said second chamber.

US 6,410,276 B1

SELECTIVE AMPLIFICATION OF TARGET POLYNUCLEOTIDE SEQUENCES

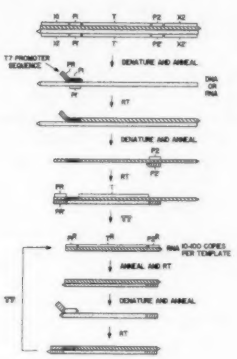
James Lawrence Burg, Foster City; Philippe Jacques Pouletty, Menlo Park, and John Charles Boothroyd, Palo Alto, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of application No. 08/121,034, filed on Sep. 13, 1993, now Pat. No. 5,437,990, which is a continuation of application No. 07/623,255, filed on Dec. 5, 1990, now abandoned, which is a continuation of application No. 07/080,479, filed on Jul. 31, 1987, now abandoned. This application Apr. 24, 1995, Appl. No. 427,606.

This patent is subject to a terminal disclaimer.

Int. Cl. C12P *19/34;* **C07H** *21/04;* **C12Q** *1/68*

U.S. Cl. 435—91.2 **56 Claims**



1. A method for increasing the number of copies of a target sequence, or the complement of said target sequence, in a polynucleotide sequence having a 3' region and a 5' region, and said target sequence therebetween, comprising the steps of:

(1) preparing a first double-stranded DNA comprising a first promoter sequence upstream from said target sequence by:

(a) contacting an RNA polynucleotide sequence comprising a target sequence with a first primer able to bind to a region upstream of said target sequence;

(b) extending said first primer with a DNA polymerase to form a primer extension product of said first primer having a sequence complementary to said target sequence,

(c) making said primer extension product of said first primer available for hybridization with a second primer,

(d) hybridizing said primer extension product of said first primer with a second primer able to bind to said primer extension product of said first primer at a region upstream of the sequence complementary to said target sequence, wherein one of said first and second primers comprises a 5' promoter sequence,

(e) extending said second primer, and if necessary said primer extension product of said first primer, with a DNA polymerase to prepare said first double-stranded DNA comprising a first promoter, and

(2) transcribing multiple RNA copies from said first double-stranded DNA using a DNA-dependent RNA polymerase able to bind said promoter to thereby increase the number of copies of said target sequence, or the complement of said target sequence.

US 6,410,277 B1

DNA POLYMERSASES WITH ENHANCED LENGTH OF PRIMER EXTENSION

Wayne M. Barnes, Chesterfield, Mo., assignor to Takara Shuzo Co., Ltd., Otsu, Japan

Continuation-in-part of application No. 08/483,535, filed on Jun. 7, 1995, which is a continuation-in-part of application No. 08/021,623, filed on Feb. 19, 1993, now Pat. No. 5,436,149. This application Sep. 16, 1997, Appl. No. 931,818.

Int. Cl. C12P *19/34*; C12Q *1/68*

U.S. Cl. 435—91.2 4 Claims

1. A formulation of thermostable DNA polymerases comprising at least one thermostable DNA polymerase lacking 3'–5' exonuclease activity and at least one thermostable DNA polymerase exhibiting 3'–5' exonuclease activity.

US 6,410,278 B1

PROCESS FOR SYNTHESIZING NUCLEIC ACID

Tsugunori Notomi, and Tetsu Hase, both of Tochigi, Japan, assignors to Eiken Kagaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP99/06213, § 371 Date Sep. 1, 2000, § 102(e) Date Sep. 1, 2000, PCT Pub. No. WO00/28082, PCT Pub. Date May 18, 2000

PCT Filed Nov. 8, 1999, Appl. No. 530,061

Claims priority, application Japan, Nov. 9, 1998, 10-317476

Int. Cl. C12P *19/34*; C12Q *1/68*; C07H *21/02*;*21/04*

U.S. Cl. 435—91.2 19 Claims

1. A method of amplifying a nucleic acid comprising:

A) providing a template having (i) a 3' end portion comprising a first region located 3' terminal and a first complementary region which, under suitable conditions, anneal to one another to form a first loop, (ii) a 5' end portion comprising a second region located 5' terminal and a second complementary region which, under suitable conditions, anneal to one another to form a second loop, and (iii) a region connecting the 3' end portion and the 5' end portion;

B) extending the 3' terminal of the template to the 5' end of the template by means of a polymerase having strand displacement activity, when the first region and first complementary region are annealed to one another to form the first loop, to form a template extension which includes a third region located 3' terminal and a third complementary region which are substantially the same as the second complementary region and second region, respectively, and which, under suitable conditions, anneal to one another to form a third loop;

C) annealing to the first loop of the extended template an oligonucleotide primer comprising at the 3' terminal a nucleotide sequence complementary to at least part of the first loop and at the 5' terminal a nucleotide sequence complementary to the first region of the template;

D) extending the oligonucleotide primer along the extended template, by means of a polymerase having strand displacement activity, to form a new template complementary to the template, thereby displacing the template extension formed during said extending in step B);

E) Further extending the 3' terminal of the extended template to the 5' end of the extended template by means of a polymerase having strand displacement activity, when the third region and the third complementary region are annealed to one another to form the third loop, thereby displacing the new template from the extended template; and

F) repeating steps A)–E) using the new template as the template in step A), thereby amplifying the nucleic acid.

US 6,410,279 B1

PROCESS FOR PRODUCING OPTICALLY ACTIVE AZETIDINE-2-CARBOXYLIC ACID DERIVATIVE

Junko Kudo, Ibaraki; Motoo Hazama, Toyonaka, and Norihiko Hirata, Suita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

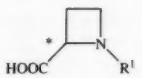
Division of application No. 09/012,227, filed on Jan. 23, 1998, now Pat. No. 6,162,621. This application Jul. 19, 2000, Appl. No. 619,386.

Claims priority, application Japan, Jan. 24, 1997, 9-011326; Jun. 3, 1997, 9-145443; Jul. 11, 1997, 9-186363

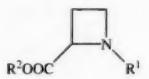
Int. Cl. C12P *17/10*

U.S. Cl. 435—121 8 Claims

1. A process for producing N-substituted azetidine-2-carboxylic acid of the formula I:



wherein R^1 denotes an aralkyl group or an arylated lower alkoxycarbonyl group and * designates an asymmetric carbon atom, which comprises: reacting an N-substituted azetidine-2-carboxylic acid ester of the formula II:



wherein R^1 has the same meaning as defined above and R^2 denotes an alkyl group, an aralkyl group or an allyl group, with an enzyme derived from a microorganism belonging to Candida, Mucor, Humicola, Rhizopus, Aspergillus, Penicillium, Bacillus, Arthrobacter, Pseudomonas, Chromobacterium, Alkaligenes or Achromobacter, and capable of selectively hydrolyzing a stereoisomer based on the carbon atom of the 2-position of the azetidine ring in an aqueous solution.

US 6,410,280 B1

DECAPRENYL DIPHOSPHATE SYNTHETASE GENE

Shusei Obata, Aichi; Tokuzo Nishino; Tanetoshi Koyama, both of Miyagi, and Yoshihiro Sato, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Division of application No. 09/025,819, filed on Feb. 19, 1998, now Pat. No. 6,225,097. This application Mar. 15, 2001, Appl. No. 808,126.

Claims priority, application Japan, Sep. 17, 1997, 9-251675

Int. Cl. C12P *7/66*

U.S. Cl. 435—133 6 Claims

1. A method for producing ubiquinone-10 comprising:

(A) culturing a transformant transformed with a recombinant vector comprising

(1) a gene coding for a recombinant protein (a) or (b) defined below:

(a) a protein having the amino sequence of SEQ ID NO:2; or

(b) a protein which has the amino acid sequence of SEQ ID NO:2 having deletion, substitution or addition of one amino acid and which has diphosphate synthase activity; or

(2) a gene having the nucleotide sequence of SEQ ID NO:1; and

(B) recovering the ubiquinone-10 from the resultant culture.

US 6,410,281 B1

REDUCING CORROSION IN A FERMENTOR BY PROVIDING SODIUM WITH A NON-CHLORIDE SODIUM SALT

William R. Barclay, Boulder, Colo., assignor to Omegatech, Inc., Boulder, Colo.

Continuation-in-part of application No. 08/968,628, filed on Nov. 12, 1997, now abandoned, which is a continuation of application No. 08/461,137, filed on Jun. 5, 1995, now Pat. No. 5,688,500, which is a continuation of application No. 08/292,490, filed on Aug. 18, 1994, now Pat. No. 5,518,918, which is a continuation of application No. 07/962,522, filed on Oct. 16, 1992, now Pat. No. 5,340,742, which is a continuation-in-part of application No. 07/911,760, filed on Jul. 10, 1992, now Pat. No. 5,340,594, which is a continuation-in-part of application No. 08/918,325, filed on Aug. 26, 1997, now Pat. No. 5,985,348, which is a division of application No. 08/483,477, filed on Jun. 7, 1995, now Pat. No. 5,698,244, which is a continuation-in-part of application No. 08/292,736, filed on Aug. 18, 1994, now Pat. No. 5,656,319, which is a continuation of application No. 07/911,760, filed on Jul. 10, 1992, now Pat. No. 5,340,594. This application Dec. 14, 1999, Appl. No. 461,663.
This patent is subject to a terminal disclaimer.
Int. Cl. A01N *25/00;* C12M *1/00;* C12N *1/00;1/18;* C12P *7/64*
U.S. Cl. 435—134 48 Claims

1. A method for reducing corrosion of a fermentor during growth of microorganisms in a saline fermentation medium, said method comprising:

obtaining microorganisms from a saline environment;

growing the microorganisms in the fermentor comprising a culture medium in which one of the primary inorganic ions is sodium which is provided in the form of a non-chloride sodium salt, wherein the culture medium contains a chloride concentration of less than about 3 grams chloride per liter of culture medium, and wherein the culture medium containing the non-chloride sodium salt as the primary source of sodium results in reduced fermentor corrosion compared to the culture medium containing sodium chloride as the primary source of sodium.

US 6,410,282 B1

METHOD FOR ENHANCING LEVELS OF POLYUNSATURATED FATTY ACIDS IN THRAUSTOCHYTRID FUNGI

Seshagiri Raghu Kumar; Dorai Rajasingam Chandramohan, and Ehrlich Desa, all of Goa, India, assignors to Council of Scientific and Industrial Research, New Delhi, India

Filed Mar. 30, 2000, Appl. No. 538,984
Int. Cl. C12P *7/64*
U.S. Cl. 435—134 6 Claims

1. A method for enhancing levels of docosahexaenoic acid and eicosapentaenoic acid in thraustochytrid fungi, comprising the steps of: (a) culturing the thraustochytrid fungal strain *Ulkenia radiata* Gaertner deposited at the National Institute of Bioscience & Human Technology, Japan and bearing Accession No. AB22115, in a culture medium for 2 to 5 days at 25° C. to 30° C.; (b) inoculating a medium containing 0.1 to 1% polyvinyl pyrrolidone with the thraustochytrid fungal strain of step (a) and culturing it for 3 days at 25° C. to 30° C.; and (c) harvesting the cells by centrifugation and extracting the enhanced amounts of docosahexaenoic acid and eicosapentaenoic acids from the cells.

US 6,410,283 B1

CONVERSION OF SEWAGE SLUDGE INTO ELECTRIC POWER

Amirali G. Rehmat, Darien; Anthony L. Lee, Glen Ellyn; Michael C. Mensinger, Darien; Anil Goyal, Willowbrook, and S. Peter Barone, Bartlett, all of Ill., assignors to Endesco Clean Harbors, L.L.C., Des Plaines, Ill.

Filed Jun. 7, 2001, Appl. No. 876,325
Int. Cl. C12P *5/02;* C02F *3/00;3/30*
U.S. Cl. 435—167 17 Claims

1. A method for generating electricity comprising the steps of:

anaerobically digesting sludge, forming a gas mixture of methane and carbon dioxide and a digested sludge;

removing water from said digested sludge, forming dewatered sludge;

gasifying said dewatered sludge in a slagging gasifier, forming a gaseous composition comprising carbon monoxide and hydrogen and a residue of non-carbonaceous material; and

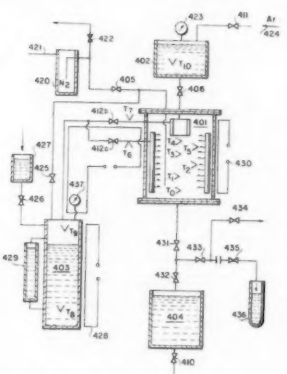
burning said methane, hydrogen and carbon monoxide in an apparatus suitable for generating electricity, resulting in a generation of electricity.

US 6,410,284 B1

METHOD FOR TREATING LIQUID MATERIALS

Yuri Vasilyevich Aksenov; Michael Nikolaevich Ivanovsky; Nikolai Ivanovich Loginov; Albina Vasilyevna Milovidova; Valentine Alexeevich Morozov, all of Kaluga, Russian Federation; Nikolai Nikolaevich Ponomarev-Stepnoi, Moscow; Boris Alexandrovich Chulkov; Alexander Lvovich Shimkevich, both of Kaluga, all of Russian Federation, and Joel B. Grae, Mamaroneck, N.Y., assignors to I. Belloch Corp., New York, N.Y.

Continuation of application No. 08/812,109, filed on Mar. 5, 1997, now Pat. No. 5,962,288, Provisional application No. 60/017,121, filed on Mar. 6, 1996. This application Oct. 4, 1999, Appl. No. 411,088.
Int. Cl. C12N *13/00;* A61L *2/00*
U.S. Cl. 435—173.1 30 Claims



1. A method for treating a biological organism in a fluid medium, to at least temporarily alter a biological membrane of the biological organism, comprising heating, while being controlled to maintain steady state process conditions, a continuous stream of the medium containing the organism by a temperature rise of at least about 2° C. at a rate which exceeds a relaxation rate of a cellular membrane of that organism, under such time and temperature conditions which do not thermally denature a substantial portion of biological proteins selected from the group consisting of one or more of proteins forming part of the biological organism and contained in the medium.

US 6,410,285 B1

ALANYL TRNA SYNTHETASE FROM *STREPTOCOCCUS PNEUMONIAE*

Elizabeth Jane Lawlor, Malvern, Pa., assignor to SmithKline Beecham Corporation, Philadelphia, Pa., and SmithKline Beecham plc, United Kingdom

Division of application No. 08/844,057, filed on Apr. 18, 1997, now Pat. No. 5,863,777. This application Jan. 14, 1998, Appl. No. 6,730.

Int. Cl. C12Q *1/68;* **C12N** *9/00;15/00;* **A61K** *38/00;* **C07K** *16/00*

U.S. Cl. 435—183 **22 Claims**

1. An isolated polypeptide comprising an amino acid sequence selected from the group consisting of:

(a) an amino acid sequence having at least 95% identity with the amino acid sequence set forth in SEQ ID NO:2; and,

(b) an amino acid sequence having at least 95% identity with the amino acid sequence set forth in SEQ ID NO:4.

US 6,410,286 B1

ASPARAGINYL TRNA SYNTHETASE FROM *STAPHYLOCOCCUS AUREUS*

John Edward Hodgson, and Elizabeth Jane Lawlor, both of Malvern, Pa., assignors to SmithKline Beecham p.l.c., United Kingdom

Division of application No. 08/785,076, filed on Nov. 17, 1997, now Pat. No. 5,789,217. This application Feb. 4, 1998, Appl. No. 18,824.

Claims priority, application United Kingdom, Jan. 19, 1996, 9601096; Jul. 27, 1996, 9615845; Oct. 30, 1996, 9622617

Int. Cl. C12N *9/00;15/00;* **C12Q** *1/68;* **C07H** *21/04*

U.S. Cl. 435—183 **20 Claims**

1. An isolated polypeptide comprising an amino acid sequence as set forth in SEQ ID NO:2.

US 6,410,287 B1

ENZYME PARTICLES

Yoshinobu Imaizumi; Koichi Ohori; Itsuro Tsukahara, and Hiroyuki Yamashita, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

PCT No. PCT/JP99/05555, § 371 Date Jun. 9, 2000, § 102(e) Date Jun. 9, 2000, PCT Pub. No. WO00/22104, PCT Pub. Date Apr. 20, 2000

PCT Filed Oct. 8, 1999, Appl. No. 581,137

Claims priority, application Japan, Oct. 9, 1998, 10-287667; Jun. 15, 1999, 11-167840

Int. Cl. C12N *9/98;11/16;11/04;* **C11D** *1/00;3/40*

U.S. Cl. 435—187 **7 Claims**

1. Enzyme granules comprising (A) a water-insoluble substance and/or a slightly water-soluble substance; (B) a water-soluble binder; and (C) an enzyme, wherein the content of said (A) component is 45% by weight or more, and wherein the enzyme granules have an average particle size of from 150 to 500 μm and a bulk density of from 500 to 1,000 g/L, and have a structure such that more amount of said (B) component is present near the surface of the enzyme granules than in the inner portion thereof.

US 6,410,288 B1

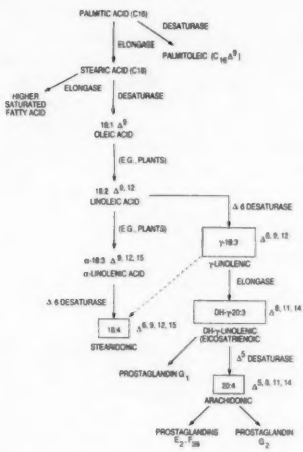
METHODS AND COMPOSITIONS FOR SYNTHESIS OF LONG CHAIN POLY-UNSATURATED FATTY ACIDS

Deborah Knutzon, Granite Bay, Calif.; Pradip Mukerji, Gahanna, Ohio; Yung-Sheng Huang, Upper Arlington, Ohio; Jennifer Thurmond, Columbus, Ohio, and Sunita Chaudhary, Westerville, Ohio, assignors to Calgene, Inc., St. Louis, Mo., and Abbott Laboratories, Abbott Park, Ill.

Division of application No. 08/834,655, filed on Apr. 11, 1997, now Pat. No. 5,968,809. This application Jul. 29, 1999, Appl. No. 363,526.

Int. Cl. C12N *9/02*

U.S. Cl. 435—189 **20 Claims**



1. An isolated and purified *Mortierella alpina* polypeptide which removes hydrogen atoms from carbons 6 and 7 as numbered from the carboxy terminus of a fatty acid molecule to form a double bond.

US 6,410,289 B1

ISOLATED HUMAN DEHYDROGENASES, NUCLEIC ACID MOLECULES ENCODING THESE HUMAN DEHYDROGENASES, AND USES THEREOF

Fangcheng Gong, Germantown; Chunhua Yan, Boyds; Valentina Di Francesco, Rockville, and Ellen M. Beasley, Darnestown, all of Md., assignors to PE Corporation, Norwalk, Conn.

Filed Dec. 20, 2000, Appl. No. 740,028

Int. Cl. C12N *9/02;15/53*

U.S. Cl. 435—189 **10 Claims**

1. An isolated nucleic acid molecule consisting of a nucleotide sequence selected from the group consisting of:

(a) a nucleotide sequence that encodes a protein comprising the amino acid sequence of SEQ ID NO:2;

(b) a nucleic acid molecule consisting of the nucleic acid sequence of SEQ ID No: 1;

(c) a nucleic acid molecule consisting of the nucleic acid sequence of SEQ ID No: 3; and

(d) a nucleotide sequence that is completely complementary to a nucleotide sequence of (a)–(c).

US 6,410,290 B1

CATALASES

Dan E. Robertson, Haddonfield; Indrajit Sanyal, Maple Shade, and Robert S. Adhikary, Cherry Hill, all of N.J., assignors to Diversa Corporation, San Diego, Calif.

Division of application No. 08/951,844, filed on Oct. 16, 1997, now Pat. No. 6,074,860, which is a division of application No. 08/674,887, filed on Jul. 3, 1996, now Pat. No. 5,939,300. This application Oct. 5, 1999, Appl. No. 412,347.

This patent is subject to a terminal disclaimer.

Int. Cl. C12N *9/08;* C12S *9/00;11/00;3/08*

U.S. Cl. 435—192 9 Claims

1. A purified protein having an amino acid sequence at least 80% identical to an amino acid sequence as set forth in SEQ ID NO:6 and having catalase activity.

US 6,410,291 B1

POLYPEPTIDES HAVING HALOPEROXIDASE ACTIVITY

Steffen Danielsen, Copenhagen, and Palle Schneider, Ballerup, both of Denmark, assignors to Novozymes A/S, Bagsvaerd, Denmark

Provisional application No. 60/202,249, filed on May 5, 2000. This application Apr. 11, 2001, Appl. No. 832,498.

Claims priority, application Denmark, Apr. 14, 2000, 2000 00626

Int. Cl. C12N *9/08;1/20;15/00;* C07H *21/04*

U.S. Cl. 435—192 11 Claims

1. An isolated polypeptide having haloperoxidase activity, selected from the group consisting of:

a) a polypeptide having an amino acid sequence which has at least 80% homology with the amino acid sequence of SEQ ID NO:2;

b) a polypeptide which is encoded by a nucleic acid sequence which hybridizes under medium stringency conditions with (i) the nucleotide sequence of SEQ ID NO:1, (ii) a subsequence of (i) of at least 100 contiguous nucleotides, or (iii) a full complementary strand of (i) or (ii).

US 6,410,292 B1

NUCLEIC ACIDS ENCODING POLYPEPTIDES HAVING HALOPEROXIDASE ACTIVITY

Steffen Danielsen, Copenhagen, and Palle Schneider, Ballerup, both of Denmark, assignors to Novozymes A/S, Bagsvaerd, Denmark, and Maxygen Inc, Redwood City, Calif.

Provisional application No. 60/202,249, filed on May 5, 2000. This application Apr. 11, 2001, Appl. No. 832,614.

Claims priority, application Denmark, Apr. 14, 2000, 2000 00626

Int. Cl. C12N *9/08;1/20;15/00;* C07H *21/04*

U.S. Cl. 435—192 10 Claims

1. An isolated nucleic acid sequence comprising a nucleic acid sequence which encodes a polypeptide having haloperoxidase activity, wherein the polypeptide is selected from the group consisting of:

a) a polypeptide having an amino acid sequence which has at least 80% homology with the amino acid sequence of SEQ ID NO:2;

b) a polypeptide which is encoded by a nucleic acid sequence which hybridizes under medium stringency conditions with (i) the nucleotide sequence of SEQ ID NO:1, (ii) a subsequence of (i) of at least 100 contiguous nucleotides, or (iii) a full complementary strand of (i) or (ii).

US 6,410,293 B1

DNA FRAGMENTS CONTAINING BIOTIN BIOSYNTHETASE GENE AND USE OF THE SAME

Fujio Mukumoto; Shoichi Nishio, both of Toyonaka; Jiro Akimaru, Nishinomiya, and Satoshi Mitsuda, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

PCT No. PCT/JP98/00858, § 371 Date Dec. 3, 1998, § 102(e) Date Dec. 3, 1998, PCT Pub. No. WO98/39452, PCT Pub. Date Sep. 11, 1998

PCT Filed Mar. 2, 1998, Appl. No. 180,109

Claims priority, application Japan, Mar. 3, 1997, 9-047838

Int. Cl. C12N *9/10*

U.S. Cl. 435—193 24 Claims

1. An isolated DNA, containing a gene for coding biotin synthase and derived from a microorganism belonging to genus Sphingomonas.

US 6,410,294 B1

ISOLATED HUMAN KINASE PROTEINS, NUCLEIC ACID MOLECULES ENCODING HUMAN KINASE PROTEINS, AND USES THEREOF

Karl Guegler, Menlo Park, Calif.; Karen A. Ketchum, Germantown, Md.; Valentina Di Francesco, Rockville, Md., and Ellen M. Beasley, Darnestown, Md., assignors to PE Corporation (NY), Norwalk, Conn.

Filed Dec. 13, 2000, Appl. No. 734,673

Int. Cl. C12N *9/12;1/20;15/00;5/00;* C07H *21/04*

U.S. Cl. 435—194 9 Claims

1. An isolated nucleic acid molecule consisting of a nucleotide sequence selected from the group consisting of:

(a) a nucleotide sequence consisting of SEQ ID NO:1;

(b) a nucleotide sequence consisting of SEQ ID NO:3; and

(c) a nucleotide sequence that is completely complementary to a nucleotide sequence of (a)–(b).

US 6,410,295 B1

ALPHA-AMYLASE VARIANTS

Carsten Andersen, Vaerløse; Christel Thea Jørgensen, K øbenhavn Ø; Henrik Bisgård-Frantzen, Bagsvaerd; Allan Svendsen, Birkerød, and Søren Kjaerulff, Vanløse, all of Denmark, assignors to Novozymes A/S, Bagsvaerd, Denmark

Provisional application No. 60/127,427, filed on Apr. 1, 1999. This application Mar. 29, 2000, Appl. No. 537,168.

Claims priority, application Denmark, Mar. 30, 1999, 00437/99

Int. Cl. C12N *9/00;9/24;9/28*

U.S. Cl. 435—202 33 Claims

1. A variant of a parent Termamyl-like alpha-amylase, said variant having alpha-amylase activity and comprising an alteration at one or more positions selected from the group consisting of:

W13, G48, T49, S50, Q51, A52, D53, V54, G57, G107, A111, S168, and M197 (using SEQ ID NO:4 for numbering), wherein the alteration(s) are independently

(i) an insertion of an amino acid downstream of the amino acid which occupies the position,

(ii) a deletion of the amino acid which occupies the position, or

(iii) a substitution of the amino acid which occupies the position with a different amino acid;

and further comprising the alteration of G108A (using SEQ ID NO:4 for numbering).

US 6,410,296 B1

HERPES VIRUS PROTEINASE AND METHOD OF ASSAYING

D. Wade Gibson, Baltimore, Md., and Anthony R. Welch, Sunnyvale, Calif., assignors to Johns Hopkins University, Baltimore, Md.

Division of application No. 09/298,819, filed on Apr. 26, 1999, now Pat. No. 6,077,679, which is a division of application No. 08/251,288, filed on May 31, 1994, now Pat. No. 6,001,967, which is a division of application No. 07/798,776, filed on Nov. 27, 1991, now Pat. No. 5,434,074, which is a continuation-in-part of application No. 07/725,308, filed on Jul. 5, 1991, now abandoned. This application Jun. 2, 2000, Appl. No. 586,562.

Int. Cl. C12N *9/50*

U.S. Cl. 435—219 **5 Claims**

1. A composition comprising a proteinase encoded by a herpes virus, said proteinase able to cleave herpes virus assembly protein precursor to form assembly protein, said composition being free of intact infectious virion DNA of the herpes virus.

US 6,410,297 B1

PROCESSES FOR PREPARATION OF MAREK'S DISEASE VIRUS USING CONTINUOUS AVIAN CELL LINES

Sing Rong, Old Lyme, and Michael G. Sheppard, North Stonington, both of Conn., assignors to Pfizer Inc, New York, N.Y.

Provisional application No. 60/111,627, filed on Dec. 9, 1998. This application Nov. 19, 1999, Appl. No. 443,800.

Int. Cl. C12N *7/00;7/08;7/02;* **A01N** *63/00;* **C07H** *21/02*

U.S. Cl. 435—235.1 **11 Claims**

1. A method for producing a Marek's Disease serotype 1, serotype 2 and serotype 3 virus (MDV), wherein said Marek's Disease virus is a wild-type or naturally occurring mutant viral particle, or a recombinant viral particle, which comprises culturing a continuous quail muscle myoblast cell line QM7 which is infected or transfected with nucleotide sequences encoding the MDV.

US 6,410,298 B1

ADENOVIRUS VECTORS AND METHOD FOR REDUCING HOMOLOGOUS RECOMBINATION PHENOMENA

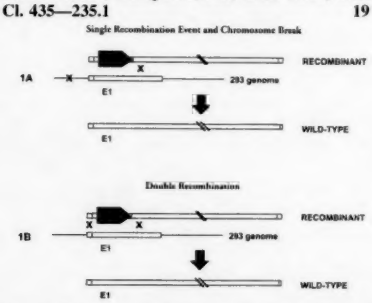
Joel Crouzet; Jean-Jacques Robert, both of Sceaux; Emmanuelle Vigne, Ivry sur Seine, and Patrice Yeh, Gif sur Yvette, all of France, assignors to Aventis Pharma S.A., Antony Cedex, France

PCT No. PCT/FR98/02453, § 371 Date Sep. 11, 2000, § 102(e) Date Sep. 11, 2000, PCT Pub. No. WO99/25861, PCT Pub. Date May 27, 1999

PCT Filed Nov. 17, 1998, Appl. No. 530,378

Int. Cl. C12N *7/00;* **C12Q** *1/70;1/68;* **C12P** *21/06;* **C07H** *21/02*

U.S. Cl. 435—235.1 **19 Claims**



1. A method for reducing the frequency of intra- or intermolecular homologous recombination events between a chromosomal nucleic acid and an extrachromosomal nucleic acid of a cell, wherein the method comprises introducing into the cell comprising the chromosomal nucleic acid that encodes a complementing function of a defective adenovirus, an extrachromosomal nucleic acid which comprises a genome of the defective adenovirus, wherein at least one of the nucleic acids is modified in such a way as to reduce its homology with the other nucleic acid.

US 6,410,299 B1

ATTENUATED FORMS OF BOVINE VIRAL DIARRHEA VIRUS

Xuemei Cao, East Lyme, and Michael G. Sheppard, Stonington, both of Conn., assignors to Pfizer Inc., New York, N.Y., and Pfizer Products Inc., Groton, Conn.

Division of application No. 09/433,262, filed on Nov. 4, 1999, now Pat. No. 6,168,942, Provisional application No. 60/107,908, filed on Nov. 10, 1998. This application Aug. 29, 2000, Appl. No. 649,796.

Int. Cl. C12N *7/04;7/00;15/09;15/86;* **C07H** *21/04*

U.S. Cl. 435—236 **9 Claims**

1. A nucleic acid molecule, comprising the sequence of SEQ ID NO:1 from nt 39 to nt 12116, or a degenerate variant thereof wherein said degenerate variant encodes the same amino acid sequence encoded by SEQ ID NO:1 from nt 39 to nt 12116.

US 6,410,300 B1

METHODS AND FORMULATIONS FOR MEDIATING ADENO-ASSOCIATED VIRUS (AAV) ATTACHMENT AND INFECTION AND METHODS FOR PURIFYING AAV

Richard Jude Samulski, and Candace Summerford, both of Chapel Hill, N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Provisional application No. 60/071,210, filed on Jan. 12, 1998. This application Jan. 11, 1999, Appl. No. 228,203.

Int. Cl. C12N *7/00;7/02*

U.S. Cl. 435—239 **48 Claims**

1. A method of purifying or concentrating adeno-associated virus (AAV) from a sample, comprising:

(a) providing a solid support comprising a matrix to which is bound a receptor-like molecule that binds AAV, wherein the receptor-like molecule comprises a polysaccharide selected from the group consisting of dermatan sulfate and dextran sulfate;

(b) contacting the solid support with a sample containing AAV; and

(c) eluting the bound AAV from the solid support.

16. A method of purifying or concentrating adeno-associated virus (AAV) from a partially purified sample, comprising:

(a) providing a partially purified sample containing AAV;

(b) contacting said partially purified sample with a solid support comprising a matrix to which is bound a receptor-like molecule that binds AAV, wherein the receptor-like molecule comprises a polysaccharide selected from the group consisting of heparin or heparan sulfate; and

(c) eluting the bound AAV from the solid support.

US 6,410,301 B1

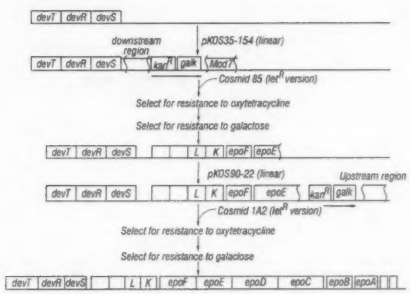
MYXOCOCCUS HOST CELLS FOR THE PRODUCTION OF EPOTHILONES

Bryan Julien, Oakland; Leonard Katz, Hayward, and Chaitan Khosla, Palo Alto, all of Calif., assignors to Kosan Biosciences, Inc., Hayward, Calif.

Continuation-in-part of application No. 09/443,501, filed on Nov. 19, 1999, now Pat. No. 6,303,342, and a continuation-in-part of application No. PCT/US99/27438, filed on Nov. 19, 1999, Provisional application No. 60/130,560, filed on Apr. 22, 1999, Provisional application No. 60/122,620, filed on Mar. 3, 1999, Provisional application No. 60/119,386, filed on Feb. 10, 1999, Provisional application No. 60/109,401, filed on Nov. 20, 1998. This application Apr. 28, 2000, Appl. No. 560,367.

Int. Cl. C12N *1/20*

U.S. Cl. 435—252.3 6 Claims



1. A recombinant Myxococcus host cell producing epothilones C and D but not epothilones A and B, said host cell containing a recombinant expression vector that contains a nucleotide sequence that encodes the epothilone polyketide synthase (PKS) of *Sorangium cellulosum*,

wherein said epothilone PKS is encoded by the epoA, epoB, epoC, epoD, epoE, epoF, and epoK genes of *Sorangium cellulosum*,

and wherein said epoK gene is modified to inactivate expression or modified to encode an inactive epoK gene product.

US 6,410,302 B1

GENETICALLY ENGINEERED YEAST AND MUTANTS THEREOF FOR THE EFFICIENT FERMENTATION OF LIGNOCELLULOSE HYDROLYSATES

K. L. Träff, Lund, Sweden; R. R. Cordero Otero; W. H. Van Zyl, both of Stellenbosch, South Africa, and B. Hahn-Hägerdal, Lund, Sweden, assignors to Forskarpatent I Syd AB, Lund, Sweden

Provisional application No. 60/082,334, filed on Apr. 20, 1998. This application Apr. 20, 1999, Appl. No. 294,894.

Int. Cl. C12N *1/14;15/00*

U.S. Cl. 435—254.2 8 Claims

1. A recombinant vector comprising at least two flanking sequences from SEQ ID NO:9,

wherein said at least two flanking sequences are not contiguous with each other on SEQ ID NO: 1 and together do not encode an aldose reductase enzyme, and

wherein one of said at least two flanking sequences from SEQ ID NO: 1 comprises nucleotides 50–470, nucleotides 1–126, nucleotides 476–990, or nucleotides 191-250 of SEQ ID NO: 1.

US 6,410,303 B1

FROZEN DOUGH-RESISTANT, PRACTICAL BAKER'S YEAST

Hiroyuki Takano; Akihiro Hino; Chie Iyo, all of Ibaraki-ken; Yasuo Suzuki, Chiba-ken, and Ryoichi Nakajima, Tokyo, all of Japan, assignors to National Food Research Institute, Ministry of Agriculture, Forestry and Fisheries, Ibaraki-ken, and Oriental Yeast Co., Ltd., Tokyo, both of Japan

Filed Oct. 21, 1997, Appl. No. 969,415

Claims priority, application Japan, Oct. 23, 1996, 8-297886

Int. Cl. C12N *1/20*

U.S. Cl. 435—254.21 2 Claims

1. A biologically pure culture of *Saccharomyces cerevisiae* T154 deposited under the accession number FERM BP-5678.

US 6,410,304 B2

METHOD OF BIOTREATMENT FOR SOLID MATERIALS IN A NONSTIRRED SURFACE BIOREACTOR

William J. Kohr, San Mateo, Calif., assignor to Geobiotics, LLC, Lakewood, Colo.

Continuation of application No. 09/097,316, filed on Jun. 12, 1998, now Pat. No. 6,159,726, which is a continuation of application No. 08/636,117, filed on Apr. 22, 1996, now Pat. No. 5,766,930, which is a continuation-in-part of application No. 08/588,589, filed on Jan. 18, 1996, now Pat. No. 6,083,730, which is a continuation-in-part of application No. 08/459,621, filed on Jun. 2, 1995, now abandoned. This application Dec. 12, 2000, Appl. No. 735,156.

This patent is subject to a terminal disclaimer.

Int. Cl. C22B *3/18;11/00;* C10G *32/00;* C12P *3/00*

U.S. Cl. 435—262 5 Claims

1. A method of biotreating a solid material to remove an undesired compound using a nonstirred surface bioreactor, said process comprising the steps of:

a. coating the surface of a plurality of coarse substrates having a particle size of less than about 0.3 cm with a solid material to be biotreated and thereby forming a plurality of coated coarse substrates, said solid material to be biotreated having a particle size of less than about 250 μm and containing an undesired compound;

b. forming a nonstirred surface reactor by stacking said plurality of coated coarse substrates into a heap or placing said plurality of coated coarse substrates into a tank, said reactor having a void volume greater than or equal to about 25% and a surface area of greater than or equal 100 square meters per cubic meter of reactor space;

c. inoculating said reactor with a microorganism capable of degrading the undesired compound in said solid material to thereby form a nonstirred surface bioreactor; and

d. biotreating said solid material in said bioreactor until said undesired compound in said solid material is degraded to a desired concentration.

US 6,410,305 B1

TREATMENT OF ANIMAL WASTE

Guy W. Miller, Minneapolis, and Gregory Scott Patterson, Hopkins, both of Minn., assignors to BioSun Systems Corporation, Maple Grove, Minn.

Continuation-in-part of application No. 08/905,573, filed on Aug. 4, 1997, now Pat. No. 5,958,758. This application Sep. 17, 1999, Appl. No. 398,727.

Int. Cl. C07G *15/00*

U.S. Cl. 435—268 56 Claims

1. A process for treating animal waste comprising the steps of:

(a) administering to an animal a probiotic material capable of promoting organic digestion; and

(b) adding an innoculum comprising sulfide-utilizing bacteria to a waste produced by the animal.

US 6,410,306 B1

ENANTIOSELECTIVE ENZYMATIC HYDROLYSIS OF 3-SUBSTITUTED ESTERS OF GLUTARIC ACID

Michael J. Homann, Clinton; William B. Morgan, Chatham Township, and Aleksey Zaks, Hoboken, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

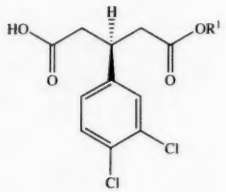
Provisional application No. 60/121,749, filed on Feb. 26, 1999. This application Feb. 24, 2000, Appl. No. 512,247.

Int. Cl. C12P 7/40;7/22

U.S. Cl. 435—280 19 Claims

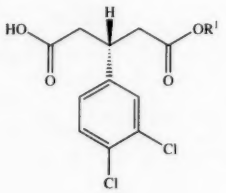
1. A process for preparing an S-enantiomer compound having the formula

(IA)



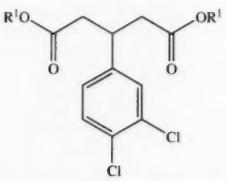
in enantiomeric excess, or an R-enantiomer compound having the formula

(IB)



in enantiomeric excess, said process comprising hydrolyzing a compound having the formula

(II)



with:

(a) an enzyme capable of producing an enantiomeric excess of the S-enantiomer compound of formula (IA) of at least 70%, or

(b) an enzyme capable of producing an enantiomeric excess of the R-enantiomer compound of formula (IB) of at least 70%, wherein R^1 is independently selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl and cycloalkylalkyl,

and recovering said S-enantiomer or R-enantiomer from said process.

US 6,410,307 B1

MEMBRANE MODULE FOR TESTING ACTIVE SUBSTANCES AT CELLS

Herma Glockner, Kleinwallstadt; Horst-Dieter Lemke, Obernburg; Friedrich Hauck, Grossheubach; Christoph Zimmerer, Amorbach, and Rudi Wollbeck, Erlenbach, all of Germany, assignors to Acordis Industrial Fibers GmbH, Wuppertal, Germany

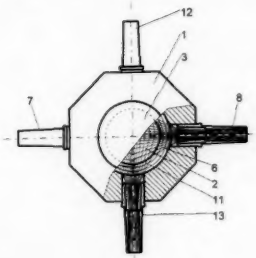
PCT No. PCT/EP00/01819, § 371 Date Nov. 21, 2001, § 102(e) Date Nov. 21, 2001, PCT Pub. No. WO00/53796, PCT Pub. Date Sep. 14, 2000

PCT Filed Mar. 2, 2000, Appl. No. 936,264

Claims priority, application Germany, Mar. 9, 1999, 199 10 539

Int. Cl. C12M 1/34

U.S. Cl. 435—287.1 15 Claims



1. A membrane module for testing active substances in cells, comprising a housing with an interior chamber, closed by a lid, a bottom, and a side wall, and a system of first capillary membranes and a system of second capillary membranes arranged in the interior chamber and optionally additional systems of capillary membranes, wherein each capillary membrane has a first and a second end as well as a lumen through which a fluid can be transported, wherein the capillary membranes in the interior chamber are located in a flat layer parallel to the bottom, and in the interior chamber of the housing in an extracapillary space around the capillary membranes a cell culture chamber is formed, wherein the capillary membranes have ends and at least one of the ends penetrates through the side wall of the interior chamber, and separated by systems, the at least one of the ends is embedded in a casting material so the interior chamber is sealed off fluid-tight from outside, and wherein the lumens of the capillary membranes of each system with their lumens have a fluid connection with an inlet device, an outlet device or both, and wherein the interior chamber has a volume between 0.1 and 5 cm^3.

US 6,410,308 B2

DEVICE FOR EXAMINING THE STERILITY OF FLUIDS

Jens Hendel, Frohngartenweg 8, D-76189 Karlsruhe, Germany

Filed Mar. 28, 2001, Appl. No. 818,852

Claims priority, application Germany, Mar. 30, 2000, 100 15 788

Int. Cl. C12M 1/34

U.S. Cl. 435—287.4 18 Claims

1. A device for examining the sterility of fluids and pharmaceutical products, the device comprising:

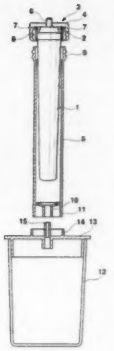
a filtering unit having an outlet;

a diaphragm filter inserted into said filtering unit for sterile filtration of the fluid;

a first container having intake means for connection to said outlet of said filtering unit to collect filtered fluids;

a second container for receiving and holding at least one nutrition medium; and

means for handling said diaphragm filter for inserting and removing said diaphragm filter into and from said filtering unit and for placing, without contact, said diaphragm filter into said second container to incubate said diaphragm filter



with the nutrition medium, to detect microorganisms.

US 6,410,309 B1

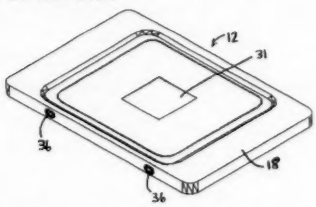
CELL CULTURE APPARATUS AND METHODS OF USE

Emilio Barbera-Guillem, Powell, and M. Bud Nelson, Worthington, both of Ohio, assignors to BioCrystal LTD, Westerville, Ohio

Continuation-in-part of application No. 09/526,006, filed on Mar. 15, 2000, Provisional application No. 60/125,712, filed on Mar. 23, 1999, Provisional application No. 60/133,415, filed on May 11, 1999. This application Nov. 28, 2000, Appl. No. 724,153.

Int. Cl. C12M *1/12*

U.S. Cl. 435—297.5 **22 Claims**



1. A cell culture apparatus comprising:

a frame comprising a housing, and at least one aperture which comprises an opening through the frame, wherein each aperture of the at least one aperture contains a septum; at least one gas permeable membrane, wherein the at least one gas permeable membrane is securedly sealed in a leak-proof sealing to the frame in forming a portion of a wall of a culture chamber; a rigid surface which forms a wall of the culture chamber, wherein the culture chamber is formed between the at least one gas permeable membrane and the rigid surface and the frame, and wherein the at least one gas permeable membrane is optically transparent and clear.

US 6,410,310 B1

CELL CULTURE EXPANSION PLATE

Philip B. Flegal, and Richard E. Gould, both of Santa Rosa, Calif., assignors to Alta Biotech, Inc., Santa Rosa, Calif.

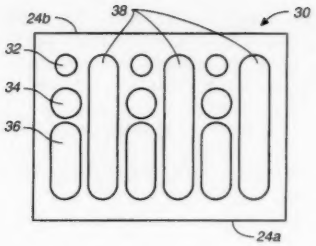
Filed Mar. 30, 2000, Appl. No. 539,471

Int. Cl. C12M *1/22*

U.S. Cl. 435—305.2 **2 Claims**

1. A cell culture expansion plate, comprising:

a base member having a top surface, a bottom surface, a border surrounding and depending downwardly from said top surface to said bottom surface and defining the sides of said base member, and at least one set of three open-topped wells



forming depressions in said top surface, each of said sets of wells including a first, a second, and a third well which, from said first well to said third well, are of increasing area at the top opening and are of increasing volume so as to accommodate expanding tissue and/or cell cultures, and wherein said first and second wells of each of said sets have a substantially circular top opening when viewed from above and said third well of each of said sets has a substantially oval shape when similarly viewed.

US 6,410,311 B1

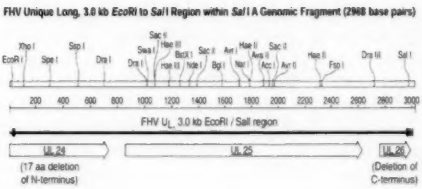
RECOMBINANT FELINE HERPESVIRUS COMPRISING A FOREIGN DNA INSERTED INTO A REGION CORRESPONDING TO A 3.0 KB ECORI-SALI FRAGMENT OF A FELINE HERPESVIRUS GENOME

Mark D. Cochran, Carlsband, and Barbara J. Winslow, Delmar, both of Calif., assignors to Schering-Plough Veterinary Corporation, Reno, Nev.

Filed May 9, 1997, Appl. No. 854,110

Int. Cl. A61K *39/29;* **C12Q** *1/70*

U.S. Cl. 435—320.1 **25 Claims**


FHV Unique Long, 3.0 kb EcoRI to Sal I Region within Sal I A Genomic Fragment (2968 base pairs)
FHV UL 3.0 kb EcoRI / SalI region
UL 24
(17 aa deletion of N-terminus)
UL 25
UL 26
(Deletion of C-terminus)

1. A recombinant feline herpesvirus comprising a foreign DNA inserted into a feline herpesvirus genome, wherein the foreign DNA is inserted into a region of the genome which corresponds to a 3.0 kb EcoRI-SalI fragment within a SalI A fragment of the feline herpesvirus genome and is capable of being expressed in a host cell into which the virus is introduced.

US 6,410,312 B1

HUBUB3 GENE INVOLVED IN HUMAN CANCERS

Todd W. Seeley, Moraga, Calif., assignor to Chiron Corporation, Emeryville, Calif.

Provisional application No. 60/068,102, filed on Dec. 19, 1997, Provisional application No. 60/070,182, filed on Dec. 30, 1997, Provisional application No. 60/088,991, filed on Jun. 11, 1998. This application Dec. 10, 1998, Appl. No. 208,743.

Int. Cl. C12N *15/00;5/00;* **C12P** *21/06;* **C07H** *21/02;21/05*

U.S. Cl. 435—320.1 **5 Claims**

1. A polynucleotide which encodes a huBUB3 protein comprising an amino acid sequence of SEQ ID NO:2.

US 6,410,313 B1

GENE DELIVERY SYSTEM AND METHODS OF USE

Noriyuki Kasahara, Los Angeles; Christopher Reid Logg, Studio City, and W. French Anderson, San Marino, all of Calif., assignors to University of Southern California, Los Angeles, Calif.

Provisional application No. 60/102,933, filed on Oct. 1, 1998. This application Oct. 1, 1999, Appl. No. 409,650.

Int. Cl. C07H *21/02;* **A61K** *48/00;* **C12N** *7/01;15/63;15/867*

U.S. Cl. 435—320.1 **39 Claims**

1. A recombinant replication competent retrovirus comprising:

a retroviral GAG protein;

a retroviral POL protein;

a retroviral envelope;

an oncoretroviral polynucleotide sequence comprising Long-Terminal Repeat (LTR) sequences at the 5' and 3' end of the oncoretroviral genome, wherein a tissue-specific promoter sequence is contained within the U3 region of the LTR sequence at the 5' or 3' or 5' and 3' end of the oncoretroviral polynucleotide sequence,

a heterologous nucleic acid sequence operably linked to a regulatory nucleic acid sequence; and

cis-acting nucleic acid sequences involved in reverse transcription, packaging and integration in a target cell.

US 6,410,314 B1

EPISOMALLY REPLICATING VECTOR, ITS PREPARATION AND USE

Armin Baiker, Lauffen/Neckar; Jürgen Bode, Schoppenstedt; Christian Fetzer, München; Hans-Joachim Lipps, Tübingen, and Christoph Piechaczek, Münster, all of Germany, assignors to MultiGene Biotech GmbH Biozentrum am Hubland, Wurzburg, Germany

Filed Oct. 5, 1999, Appl. No. 412,825

Claims priority, application Germany, Oct. 17, 1998, 198 48 017

Int. Cl. C12N *15/00;15/64*

U.S. Cl. 435—320.1 **26 Claims**

1. A stably episomally replicating vector wherein said vector is retained for over at least 30 generations of cell divisions without the ongoing application of selective pressure, comprising a nucleic acid sequence encoding at least one scaffold/matrix attached region (S/MAR) originating from the 5' region of the interferon β gene and at least one SV40 or BPV origin of replication (ORI).

US 6,410,315 B1

GENES ENCODING POLYPEPTIDES CONTAINING SIGNAL SEQUENCES

Sean A. McCarthy, Boston, and Steven Bossone, Lexington, both of Mass., assignors to Millennium Pharmaceuticals, Inc., Cambridge, Mass.

Division of application No. 08/966,269, filed on Nov. 7, 1997, now Pat. No. 6,046,000. This application Nov. 8, 1999, Appl. No. 436,183.

Int. Cl. C12N *15/63;5/00;* **C07H** *21/04*

U.S. Cl. 435—320.1 **14 Claims**

1. An isolated nucleic acid molecule comprising a nucleotide sequence which encodes a polypeptide comprising the amino acid sequence of SEQ ID NO:2 or 4.

US 6,410,316 B1

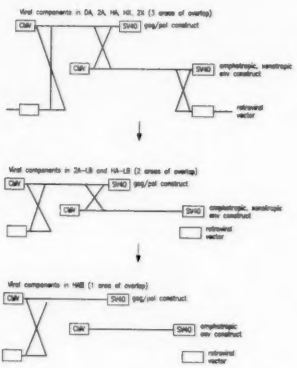
METHODS FOR PRODUCING A VECTOR PRODUCING CELL LINE UTILIZING A HIGH MULTIPLICITY OF TRANSDUCTION

Philip L. Sheridan; Mordechai Bodner, both of San Diego; Nicholas J. DePolo, Solana Beach; Sybille Sauter, Del Mar, and Stephen M. W. Chang, Poway, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Provisional application No. 60/124,468, filed on Mar. 15, 1999. This application Mar. 15, 2000, Appl. No. 526,983.

Int. Cl. C12N *15/00;* **C12Q** *1/70;* **C12P** *21/04;* **C07H** *21/04;* **A61K** *39/12*

U.S. Cl. 435—320.1 **15 Claims**



1. An isolated retroviral vector particle producing cell, wherein said cell (a) has greater than 5 stably integrated copies of a retroviral vector construct; (b) produces greater than 10 infectious recombinant retroviral vector particles per cell per day; (c) produces replication incompetent retroviral vector particles, wherein said cell stably produces infectious recombinant retroviral vector particles over at least 50 cell doublings.

US 6,410,317 B1

RECOMBINASE-BASED METHODS FOR PRODUCING EXPRESSION VECTORS AND COMPOSITIONS FOR USE IN PRACTICING THE SAME

Andrew Alan Farmer, Mountain View, Calif., assignor to Clontech Laboratories, Inc., Palo Alto, Calif.

Continuation-in-part of application No. 09/356,001, filed on Jul. 14, 1999, now abandoned. This application Jul. 14, 2000, Appl. No. 616,651.

Int. Cl. C12N *15/63*

U.S. Cl. 435—320.1 **28 Claims**

1. A donor vector comprising:

first and second recombinase recognition sites oriented in the same direction and flanking a partial selectable marker, wherein said first and second recombinase recognition sites are able to recombine with each other.

US 6,410,318 B1

ANTIBODIES DIRECTED AGAINST BINDING-ASSOCIATED EPITOPES

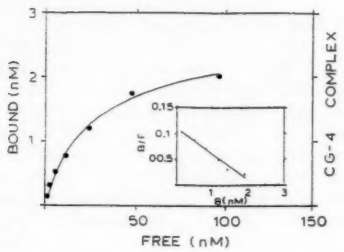
Jonathan M. Gershoni, Rehovot, Israel, assignor to Ramot University for Applied Research and Industrial Development Ltd., Israel

Division of application No. 09/433,420, filed on Nov. 4, 1999, now Pat. No. 6,143,876, which is a division of application No. 09/235,592, filed on Jan. 22, 1999, now Pat. No. 6,020,468, which is a continuation of application No. 08/464,726, filed as application No. PCT/US93/12639, filed on Dec. 29, 1993, now Pat. No. 5,925,741. This application Aug. 24, 2000, Appl. No. 645,648.

Claims priority, application Israel, Dec. 31, 1992, 104291; Feb. 17, 1993, 104767

Int. Cl. C12N *5/06;* **C07K** *16/00;* **A61K** *39/42*

U.S. Cl. 435—339.1 **6 Claims**



1. A method for treating a viral infection, comprising administering to a patient an effective amount of an antibody having a binding affinity to an antigenic epitope on a complex formed between two members of a binding couple, wherein said antigenic epitope is a member of a group consisting of:

(i) an epitope consisting of a sequence in a member of a binding couple, which becomes substantially more accessible to antibodies or resumes a new conformation after binding of the two members to one another,

(ii) an epitope consisting of two or more sequences in a member of binding couple which upon binding of the two members, become closely associated to form an antigenic epitope, and

(iii) an epitope consisting of two or more sequences, at least one being in one member of a binding couple, and at least one other being in the other member of the binding couple and upon binding of the two members, said two or more amino acid sequences become closely associated with one another to form an antigenic epitope;

said antigenic epitope being immunogenic.

US 6,410,319 B1

CD20-SPECIFIC REDIRECTED T CELLS AND THEIR USE IN CELLULAR IMMUNOTHERAPY OF CD20+ MALIGNANCIES

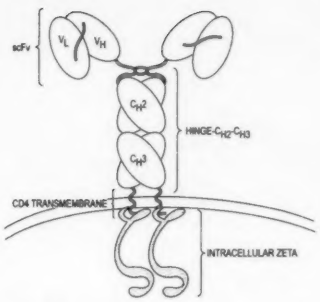
Andrew Raubitschek, San Marino; Anna Wu, Sherman Oaks, and Michael C. Jensen, Pasadena, all of Calif., assignors to City of Hope, Duarte, Calif.

Provisional application No. 60/105,014, filed on Oct. 20, 1998. This application Oct. 20, 1999, Appl. No. 421,295.

Int. Cl. C12N *5/06;15/00;5/00;5/08;* **C07H** *21/04*

U.S. Cl. 435—343.1 **22 Claims**

1. A DNA construct encoding a CD20-specific chimeric T cell receptor wherein the receptor consists of an intracellular signaling domain selected from the group consisting of the human CD3 zeta chain, FcγRIII and FcεRI, a transmembrane domain and an extracellular domain, the extracellular domain comprising a CD20-



specific receptor.

US 6,410,320 B1

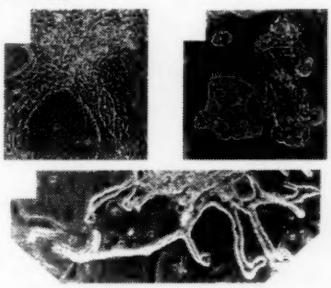
METHOD AND COMPOSITIONS FOR ISOLATION AND GROWTH OF KIDNEY TUBULE STEM CELLS, IN VITRO KIDNEY TUBULOGENESIS AND EX VIVO CONSTRUCTION OF RENAL TUBULES

H. David Humes, Ann Arbor, Mich., assignor to The University of Michigan, Ann Arbor, Mich.

Continuation-in-part of application No. 07/844,758, filed on Mar. 2, 1992, now Pat. No. 5,429,938. This application Jan. 31, 2000, Appl. No. 494,044.

Int. Cl. C12N *5/00;5/02;5/06;5/08;5/10;15/63;15/85;* **A61K** *7/035;* **A01W** *63/00*

U.S. Cl. 435—369 **3 Claims**



1. An isolated and purified population of renal stem cells which has been cultured and expanded ex vivo, wherein the cells have been passaged at least three times, wherein the population retains renal stem cells after at least three passages, and wherein the stem cells are capable of differentiating into renal proximal tubule cells.

US 6,410,321 B1

METHOD AND FORMULATION FOR LYOPHILIZING CULTURED HUMAN CELLS TO PRESERVE RNA AND DNA CONTAINED IN CELLS FOR USE IN MOLECULAR BIOLOGY EXPERIMENTS

Ching-I Patsy Lin, Hercules; Robert Bruce Wallace, Greenbrae, both of Calif.; Jeffrey Cossman, Potomac, Md., and Cynthia French, Irvine, Calif., assignors to Bio-Rad Laboratories, Inc., Hercules, Calif.

Division of application No. 08/884,029, filed on Jun. 27, 1997, now Pat. No. 6,071,745. This application Apr. 7, 2000, Appl. No. 545,225.

Int. Cl. C12N *5/02;5/00;5/08*

U.S. Cl. 435—374 **7 Claims**

1. A kit comprising vials of eukaryotic cells lyophilized in a RNase-free aqueous, isotonic solution treated with diethyl pyrocar-

bonate for use as controls in diagnostic assays, wherein the cells after 4 weeks at 20° C. have more than 50% of their 18S rRNA intact as measured by gel electrophoresis.

US 6,410,322 B1

ANTISENSE OLIGONUCLEOTIDE INHIBITION OF VASCULAR ENDOTHELIAL GROWTH FACTOR EXPRESSION

Gregory S. Robinson, 194 School St., Acton, Mass. 01720

Filed Jul. 27, 1993, Appl. No. 98,942

Int. Cl. C12N *5/02;* **C07H** *21/04*

U.S. Cl. 435—375 **10 Claims**

1. An antisense oligonucleotide having the sequence 5'-CAGCCTGGCTCACCGCCTTGG-3' (SEQ ID NO 6).

US 6,410,323 B1

ANTISENSE MODULATION OF HUMAN RHO FAMILY GENE EXPRESSION

M. Luisa Roberts, Noank, Conn., and Lex M. Cowsert, Carlsbad, Calif., assignors to ISIS Pharmaceuticals, Inc., Carlsbad, Calif.

Filed Aug. 31, 1999, Appl. No. 387,341

Int. Cl. C12Q *1/68;* **C12N** *15/85;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—375 **13 Claims**

1. An antisense compound 8 to 30 nucleobases in length targeted to an nucleic acid molecule encoding human cdc42 that comprises at least an 8 nucleobase portion of SEQ ID NO: 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229 or 230, and wherein said antisense compound inhibits expression of human cdc42.

US 6,410,324 B1

ANTISENSE MODULATION OF TUMOR NECROSIS FACTOR RECEPTOR 2 EXPRESSION

C. Frank Bennett, Carlsbad, and Andrew T. Watt, Vista, both of Calif., assignors to ISIS Pharmaceuticals, Inc., Carlsbad, Calif.

Filed Apr. 27, 2001, Appl. No. 844,634

Int. Cl. C12Q *1/68;* **C07H** *21/04;* **C12N** *15/85*

U.S. Cl. 435—375 **26 Claims**

1. A compound 8 to 30 nucleobases in length targeted to nucleobases 198 through 1472 of a coding region, or nucleobases 1512 through 3671 of a 3'-untranslated region of a nucleic acid molecule encoding a human Tumor Necrosis Factor Receptor 2 (SEQ ID NO: 3), or nucleobases 4477 through 8921 of an intron region encoding human Tumor Necrosis Factor Receptor 2 (SEQ ID NO: 17), or nucleobases 70–1164 of a coding region or nucleobases 1726–3751 of a 3'-untranslated region of a nucleic acid molecule encoding a mouse Tumor Necrosis Factor Receptor 2 (SEQ ID NO: 10), or nucleobases 698–743 of an intron region of a nucleic acid molecule encoding murine Tumor Necrosis Factor Receptor 2 (SEQ ID NO:98), wherein said compound specifically hybridizes with one or said regions and inhibits the expression of Tumor Necrosis Factor Receptor 2.

US 6,410,325 B1

ANTISENSE MODULATION OF PHOSPHOLIPASE A2, GROUP VI (CA2+-INDEPENDENT) EXPRESSION

C. Frank Bennett, Carlsbad; Susan M. Freier, San Diego, and Andrew T. Watt, Vista, all of Calif., assignors to ISIS Pharmaceuticals, Inc., Carlsbad, Calif.

Filed May 9, 2001, Appl. No. 851,896

Int. Cl. C12Q *1/68;* **C07H** *21/04;* **C12N** *15/85*

U.S. Cl. 435—375 **13 Claims**

1. A compound up to 50 nucleobases in length comprising at least an 8-nucleobase portion of SEQ ID NO: 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 47, 48, 49, 50, 52, 54, 55, 56, 57, 58, 60, 61, 63, 64, 65, 66, 67, 68, 70, 73, 75, 76, 77, 79, 80, 82, 84, 87, 88 or 89 which inhibits the expression of Phospholipase A2, group VI (Ca2+-independent).

US 6,410,326 B1

METHOD FOR INHIBITING HUMAN TUMOR CELLS

Harry E. Gruber, San Diego; Douglas J. Jolly, La Jolla; James G. Respess, San Diego; Paul K. Laikind, San Diego; Jack R. Barber, San Diego, all of Calif.; Daniel C. St. Louis, Rockville, Md.; Sunil D. Chada, Vista, Calif.; Stephen M. W. Chang, and John F. Warner, both of San Diego, Calif., assignors to Chiron Corporation, Emeryville, Calif.

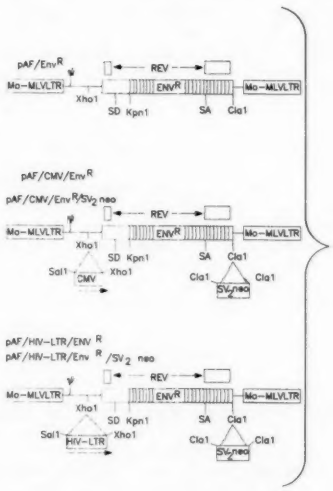
Division of application No. 08/344,743, filed on Nov. 23, 1994, which is a continuation of application No. 08/139,994, filed on Oct. 20, 1993, now abandoned, which is a continuation of application No. 07/965,084, filed on Oct. 22, 1992, now abandoned, which is a continuation of application No. 07/586,603, filed on Sep. 21, 1990, now abandoned, which is a continuation-in-part of application No. 07/565,606, filed on Aug. 10, 1990, now abandoned, which is a continuation-in-part of application No. 07/395,932, filed on Aug. 18, 1989, now abandoned, which is a continuation-in-part of application No. 07/170,515, filed on Mar. 21, 1988, now abandoned.

This application Jun. 7, 1995, Appl. No. 486,683.

This patent is subject to a terminal disclaimer.

Int. Cl. C12N *15/63*

U.S. Cl. 435—455 **10 Claims**



1. A method for destroying human tumor cells, comprising:

(a) infecting human tumor cells with a recombinant, replication defective retroviral construct comprising a gene encoding a conditionally lethal gene product operatively linked to a promoter for expression in said infected cells, said conditionally lethal gene product processing within said infected cells a purine-based or pyrimidine-based prodrug from its non-toxic precursor form to its active toxic form; and

(b) contacting said infected tumor cells with said prodrug, said conditionally lethal gene product processing within said infected cell said prodrug from its non-toxic precursor form to its active toxic form. whereupon said tumor cells are destroyed.

US 6,410,327 B2

METHODS FOR THE SELECTIVE REGULATION OF DNA AND RNA TRANSCRIPTION AND TRANSLATION BY PHOTOACTIVATION

Frederick R. Haselton, III, Nashville, Tenn., and J. Steven Alexander, Shreveport, La., assignors to Vanderbilt University Office of Technology Transfer, Nashville, Tenn.

Division of application No. 09/478,092, filed on Jan. 5, 2000, now Pat. No. 6,242,258, which is a division of application No. 09/026,794, filed on Feb. 20, 1998, now Pat. No. 6,017,758, Provisional application No. 60/038,676, filed on Feb. 20, 1997. This application Apr. 18, 2001, Appl. No. 837,830.

Int. Cl. C12N *15/63;15/85;15/86;15/88;* **A61K** *31/70*

U.S. Cl. 435—455 **18 Claims**

1. A method of selectively regulating the expression of an endogenous nucleic acid in a cell comprising: a) covalently linking a nucleic acid encoding an antisense nucleic acid to a photolabile caging group which reversibly prevents expression of the nucleic acid; b) introducing the nucleic acid of step (a) into the cell; and c) exposing the cell of step (b) to light, whereby exposure to the light unlinks the nucleic acid and the caging group and the nucleic acid is selectively expressed in the cell as an antisense nucleic acid which can bind to and inactivate a complementary nucleic acid within the cell, wherein the caging group is selected from the group consisting of 1-(4,5-dimethyoxy-2-nitrophenyl) ethyl, (2-nitrophenyl) ethyl, 5-carboxymethoxy-2-nitrobenzyl, 5-carboxymethoxy-2-nitrobenzyl)oxy)carbonyl, 4,5-dimethyoxy-2-nitrobenzyl, 4,5-dimethoxy-2-nitrobenzyl)oxy)carbonyl, alpha-carboxy-2-nitrobenzyl, 1-(2-nitrophenyl)ethyl, 2-nitrobenzyl and Desoxybenzoinyl.

US 6,410,328 B1

SENSITIZING CELLS TO COMPOUNDS USING LIPID-MEDIATED GENE AND COMPOUND DELIVERY

Ian Maclachlan; Susan S. Buchkowsky, and Roger W. Graham, all of Vancouver, Canada, assignors to Protiva Biotherapeutics Inc., Burnaby, Canada

Provisional application No. 60/112,384, filed on Dec. 14, 1998, Provisional application No. 60/073,598, filed on Feb. 3, 1998, Provisional application No. 60/101,429, filed on Sep. 22, 1998, Provisional application No. 60/086,917, filed on May 27, 1998. This application Feb. 2, 1999, Appl. No. 243,104.

Int. Cl. C12N *15/88*

U.S. Cl. 435—458 **22 Claims**

1. A method of sensitizing a cell to an anti-tumor compound, said method comprising:

a) transfecting a cell with a vector comprising a polynucleotide sequence encoding a prodrug activating enzyme that promotes the processing of a non-lipid derivatized prodrug into said anti-tumor compound; and

b) delivering to said cell said non-lipid derivatized prodrug in a lipid formulation;

wherein said cell is more sensitive to said anti-tumor compound than said non-lipid derivatized prodrug.

US 6,410,329 B1

METHOD FOR ACHIEVING SITE SPECIFIC INTEGRATION OF EXOGENOUS DNA DELIVERED BY NON-BIOLOGICAL MEANS TO PLANT CELLS

Genevieve Hansen, Durham; MaryDell Chilton, and Janet Louise Suttie, both of Raleigh, all of N.C., assignors to Novartis Finance Corporation, New York, N.Y.

Division of application No. 09/050,313, filed on Mar. 30, 1998, now abandoned, which is a continuation of application No. 08/717,676, filed on Sep. 23, 1996, now Pat. No. 6,051,409, Provisional application No. 60/004,220, filed on Sep. 25, 1995, Provisional application No. 60/020,253, filed on Jun. 19, 1996. This application May 18, 2000, Appl. No. 574,132.

Int. Cl. C12N *15/82*

U.S. Cl. 435—468 **6 Claims**

1. A method of site specific integration of a gene of interest into the genome of a plant cell containing a recombinase site, comprising co-delivery into the plant cell an mRNA encoding a recombinase and a DNA sequence comprising the gene of interest flanked by nucleotide sequences recognized by the recombinase.

US 6,410,330 B1

METHOD FOR MEASUREMENT OF NUCLEATED RED BLOOD CELLS

Yi Li; Jing Li, both of Miami, and Ted W. Britton, Sunrise, all of Fla., assignors to Coulter International Corp., Miami, Fla.

Filed Jul. 27, 2001, Appl. No. 917,533

Int. Cl. G01N *31/00*

U.S. Cl. 436—10 **26 Claims**

1. A method of differentiating nucleated red blood cells from other cell types in a blood sample comprising the steps of:

(a) mixing a blood sample with a lytic reagent to lyse red blood cells, and to form a blood sample mixture,

(b) measuring said blood sample mixture by a DC impedance measurement, and using said measurement to obtain a blood cell distribution of said blood sample mixture,

(c) differentiating nucleated red blood cells from other cell types from said blood cell distribution obtained in step B, and

(d) reporting nucleated red blood cells in said blood sample.

US 6,410,331 B1

COMBINATORIAL SCREENING OF INORGANIC AND ORGANOMETALLIC MATERIALS

Peter G. Schultz, Oakland; Xiaodong Xiang, and Isy Goldwasser, both of Alameda, all of Calif., assignors to Symyx Technologies, Inc., Santa Clara, and The Regents of University of California, Oakland, both of Calif.

Division of application No. 08/327,513, filed on Oct. 18, 1994, now Pat. No. 5,985,356. This application Jul. 27, 1998, Appl. No. 122,932.

Int. Cl. G01N *31/10*

U.S. Cl. 436—37 **46 Claims**

1. A method for evaluating an array of materials, the method comprising

providing an array of materials comprising at least ten different organometallic materials at discrete regions of a substrate, the at least ten material-containing regions being isolated such that the materials or components thereof cannot, after being formed or deposited on the substrate, interdiffuse between adjacent regions, and

screening the array in parallel for a useful property of interest using optical microscopy at different wavelengths.

US 6,410,332 B1

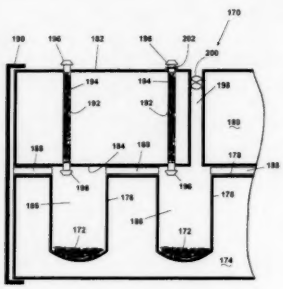
SAMPLING AND ANALYSIS OF REACTIONS BY TRAPPING REACTION COMPONENTS ON A SORBENT

Peter J. Desrosiers, Cupertino; Christopher E. Dubé, San Jose, and Xiao Ping Zhou, Sunnyvale, all of Calif., assignors to Symyx Technologies, Inc., Santa Clara, Calif.

Filed Sep. 8, 1998, Appl. No. 149,586

Int. Cl. G01N *31/10*

U.S. Cl. 436—37 **77 Claims**



26. A method of screening a library of catalysts, the method comprising

combining each of a plurality of catalysts with at least one reactant so as to form a plurality of reaction mixtures,

contacting a fluid sample from one of the reaction mixtures with a sorbent,

selectively trapping at least one component of the fluid sample on the sorbent, and

detecting the at least one component of the fluid sample trapped on the sorbent,

the contacting step, the trapping step, and the detecting step being carried out at least once for each of the plurality of reaction mixtures.

US 6,410,333 B1

ASSESSMENT OF HUMAN SKIN DAMAGE FOLLOWING EXPOSURE TO HARMFUL AGENTS

Mahmoud Rouabhia, Cap-Rouge; Régen Drouin, Québec; Marc Rhainds, Beauport, and Joël Claveau, Cap-Rouge, all of Canada, assignors to Université Laval, Québec, Canada

Continuation of application No. PCT/CA98/00609, filed on Jun. 15, 1998. This application Dec. 13, 1999, Appl. No. 459,615.

Claims priority, application Canada, Jun. 17, 1997, 2207882

Int. Cl. G01N *33/48*

U.S. Cl. 436—63 **29 Claims**

1. A process to assess the efficacy of a sunscreen preparation against harmful effects of environmental agents, which comprises the steps of:

a) providing human cutaneous cells and extracellular matrix in in vitro cultured conditions;

b) treating said human cutaneous cells and matrix of step a) with a sunscreen;

c) submitting said treated human cutaneous cells and matrix of step b) to at least one environmental agent for a period of time sufficient to induce structural damage and DNA damage;

d) measuring said structural damage and said DNA damage of step c); and

e) correlating said measuring of step d) with the efficacy of said sunscreen.

US 6,410,334 B1

METHOD FOR DETERMINING THE IMMUNE DEFENSE OF BLOOD AND TEST KIT FOR THE SAME AND USE OF A SUITABLE BLOOD SAMPLING SYSTEM

Manfred Schmolz, Reutlingen, Germany, assignor to EDI (Experimentelle & Diagnostische Immunologie) GmbH, Reutlingen, Germany

PCT No. PCT/EP99/05635, § 371 Date Mar. 16, 2001, § 102(e) Date Mar. 16, 2001, PCT Pub. No. WO00/08464, PCT Pub. Date Feb. 17, 2000

PCT Filed Aug. 4, 1999, Appl. No. 762,189

Claims priority, application Germany, Aug. 7, 1998, 198 35 721

Int. Cl. G01N *33/48;* **C12Q** *1/00;1/02*

U.S. Cl. 436—63 **18 Claims**

1. Method for determining the immune defence activity of blood by incubating the whole blood in the presence of nutrient medium and anticlotting agent in a blood sampling system used for blood sampling purposes, blood incubation taking place substantially immediately following blood sampling at approximately 37° C. and for 8 to 60 hours, without prior separation of the red corpuscles, by bringing the blood into contact in extracorporal manner with blood anticlotting agent which includes anticoagulant heparin, at least one stimulant (activating agent) for stimulating the blood cells to deliver messenger substances, followed by a separation of blood corpuscles from the supernatant without prior centrifuging, and the determination of the immune defence activity using the messenger substances contained in the supernatant, using a medical blood sampling system with a displaceable syringe piston, with a temporarily permeable partition for the incubation of whole blood in the blood sampling system and subsequent separation of supernatant serum from the blood corpuscles with the aid of the partition.

US 6,410,335 B1

CIRCULATING INSULIN-LIKE GROWTH FACTOR-I AND PROSTATE CANCER RISK

Michael N. Pollak, Montreal, Canada; Meir J. Stampfer, Brookline, and Edward Giovannucci, Wakefield, both of Mass., assignors to The Brigham and Woman's Hospital, Inc., Boston, Mass., and Sir Mortimer B. Davis - Jewish General Hospital Foundation, Montreal, Canada

Provisional application No. 60/072,560, filed on Jan. 21, 1998. This application Jan. 21, 1999, Appl. No. 234,651.

Int. Cl. G01N *33/48;* **C12Q** *1/00*

U.S. Cl. 436—64 **6 Claims**

1. A method of predicting an increased risk for prostate cancer, comprising:

a) measuring the concentration of IGF-I in a body fluid from each individual of a reference group of healthy individuals without prostate cancer to establish a reference level;

b) measuring the concentration of IGF-I in a body fluid from an individual; and

c) comparing the concentration of ICF-I in the individual to the reference level, wherein an elevated concentration of IGF-I of 100 ng/ml above the reference level indicates a doubling of the risk for prostate cancer.

US 6,410,336 B1

METHOD REAGENT AND KIT FOR THE DETECTION OF FECAL OCCULT BLOOD

Thomas A. Augurt, New Canaan, Conn., assignor to Propper Manufacturing Co., Ltd., Long Island City, N.Y.

Division of application No. 08/121,072, filed on Sep. 14, 1993, now Pat. No. 5,447,868. This application May 12, 1995, Appl. No. 439,602.

This patent is subject to a terminal disclaimer.

Int. Cl. G01N *33/72*

U.S. Cl. 436—66 **17 Claims**

1. A method for detecting occult blood in a specimen comprising combining the specimen with

(a) hydrogen peroxide or a peroxide source;

(b) an oxidizable substrate that produces a colored product in the presence of peroxide and hemoglobin; and

(c) an enhancer consisting of a composition selected from the group consisting of tertiary and quaternary amines having a phenyl or substituted phenyl group attached to the nitrogen in a liquid carrier, wherein the peroxide, oxidizable substrate and enhancer are combined with the specimen in amounts effective to produce a visually detectable color change if medically significant amounts of occult blood are present in the specimen.

US 6,410,337 B1

METHOD OF PLATLET FUNCTION ANALYSIS USING PLATELET COUNT

Terry Brady, Gladstone, and Michael F. Corsello, West Milford, both of N.J., assignors to Helena Laboratories Corporation, Beaumont, Tex.

Filed Sep. 18, 1997, Appl. No. 933,181

Int. Cl. G01N *33/86*

U.S. Cl. 436—69 **14 Claims**

1. A method for measuring platelet function by the counting of platelets before and after exogenous platelet activation comprising:

(a) selecting first and second samples comprising platelets in a liquid medium from a physiological source of said platelets wherein each of said samples contains approximately the same number of platelets;

said first sample containing a substance which suppresses platelet activation and said first sample being essentially devoid of any agent which produces exogenous platelet activation to cause the platelets therein to aggregate;

said second sample being essentially devoid of any agent that interferes with platelet function;

(b) counting the platelets in said first sample in the absence of an activation agonist to obtain a baseline count of the platelets;

(c) mixing an amount of at least one activation agonist with said second sample to produce exogenous platelet activation for a period of time effective to maximally activate and cause aggregation of activatable platelets in said second sample;

(d) counting the platelets in said second sample after exogenous platelet activation to obtain a second count of unactivated platelets in said second sample; and

(e) utilizing the difference between the baseline count of platelets in step (b) and the second count obtained in step (d) as a measure of the activity of the platelets in the physiological source.

US 6,410,338 B1

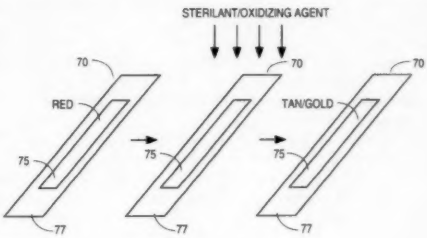
METHOD OF INDICATING AN OXIDIZING AGENT

Thomas G. Lippold, Fullerton; Nitu Kohli, Lake Forest; Pascale D. Endo, Fountain Valley; Henry K. Hui, Laguna Niguel, and Szu-Min Lin, Laguna Hills, all of Calif., assignors to Ethicon, Inc., Somerville, N.J.

Filed May 14, 1999, Appl. No. 312,195

Int. Cl. A61L *9/00*

U.S. Cl. 436—166 **5 Claims**



1. A method comprising:

exposing an indicator comprising an aurin moiety to an oxidizing agent comprising a chemically active germicide; and

detecting the exposure by a color change of the aurin moiety.

US 6,410,339 B1

PREPARATION FOR DIAGNOSIS OF THE METABOLIC SYNDROME AND DISEASES INCLUDING THE SYNDROME

Per Märin, Göteberg, Sweden, assignor to Cortenda AB, Gothenburg, Sweden

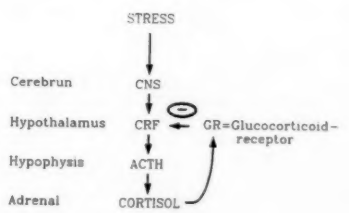
PCT No. PCT/SE96/00708, § 371 Date Feb. 26, 1998, § 102(e) Date Feb. 26, 1998, PCT Pub. No. WO96/38179, PCT Pub. Date Dec. 5, 1996

PCT Filed May 30, 1996, Appl. No. 952,638

Claims priority, application Sweden, May 30, 1995, 9501991

Int. Cl. G01N *33/53;* **C12Q** *3/00*

U.S. Cl. 436—500 **13 Claims**



1. A method for diagnosing Metabolic Syndrome in an individual, said method comprising:

(a) administering a cortisol agonist to said individual;

(b) determining the inhibitory effect of said cortisol agonist on the production of cortisol by said individual between 3 and 24 hours after administering said cortisol agonist; and

(c) diagnosing said individual for Metabolic Syndrome based on the inhibitor effect determined.

US 6,410,340 B1

USE OF AN 8.4 KDA PROTEIN AS AN IMMUNOPHILIN REAGENT IN PROTEIN BINDING ASSAYS FOR IMMUNOSUPPRESSIVE DRUGS

Steven J. Soldin, Bethesda, Md., assignor to Children's Research Institute, Washington, D.C.

Filed Aug. 23, 2000, Appl. No. 643,723

Int. Cl. G01N *33/567;33/533;33/534;33/535*

U.S. Cl. 436—503 **10 Claims**

1. A protein binding assay method for the immunosuppressant drugs FK-506, rapamycin, and pharmacologically active metabolites or derivatives thereof ("analytes"), in a fluid sample, comprising the steps of:

(a) contacting said fluid sample with an isolated about 8.4 kDa binding protein ("immunophilin") so that a complex forms between said analyte and said binding protein;

(b) quantifying the amount of analyte specifically bound to said binding protein; and,

(c) relating the amount of said analyte specifically bound to the concentration of said drug in said fluid sample;

wherein said isolated about 8.4 kDa immunophilin exhibits the following characteristics: (i) the first 23 amino acid sequence is identical to that of authentic ubiquitin; (ii) retention times on HPLC are identical to those of authentic ubiquitin; (iii) migrates on SDS-PAGE plates identically to HPLC-purified commercial ubiquitin; (iv) exhibits a Kd of about 0.8 nM for FK-506 and 0.08 nM for rapamycin; (v) has a Hill plot value of about unity; and (vi) when complexed to FK-506 inhibits calcineurin phosphatase activity.

US 6,410,341 B1

ANALYTICAL TEST DEVICE AND METHOD FOR USE IN MEDICAL DIAGNOSES

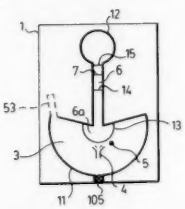
Helmut E. Freitag, Birmingham, United Kingdom; Qinwei Shi, Etobicoke, Canada, and Charles A. Harrington, Austin, Tex., assignors to Spectral Diagnostics, Inc., Toronto, Canada

Continuation-in-part of application No. 09/130,164, filed on Aug. 6, 1998. This application Jul. 14, 1999, Appl. No. 353,188.

This patent is subject to a terminal disclaimer.

Int. Cl. G01N *33/558*

U.S. Cl. 436—514 **64 Claims**



1. An analytical test device suitable for determining the presence of at least one analyte contained in a sample while permitting rapid and efficient flow of the sample through at least one defined pathway in which reactions determinative of the analyte take place, said device comprising:

a top layer having an upper surface formed with a through hole for the addition of the sample, said through hole being in registry with a sample delivery channel formed in a lower surface of the top layer, said sample delivery channel having walls defined by said lower surface of said top layer and an upper surface of a bottom layer, said sample delivery channel in operative communication with a sample circulation channel closed at its terminal ends and formed with inner and outer walls to define a pathway for the sample in the lower surface of the top layer, the inner walls of the circulation channel defining an indent in the lower surface of the top layer;

the bottom layer attached to the top layer, a dry porous carrier therebetween in contact with said walls of said sample circulation channel and providing a fluid pathway therefrom;

said fluid pathway of said dry porous carrier layer configured to contain at least one detection zone having a border in operative communication with the sample circulation channel, the sample being permitted to enter into said detection zone from said sample circulation channel from a plurality of different directions; and an opposite end in operative communication with a capture zone channel having an entrance end and a closed terminal end to provide a conduit through which the liquid sample may flow by capillary action from the sample circulation channel to the terminal end of the capture zone channel, the distances between all points where the sample is permitted to enter the detection zone and said entrance end being essentially the same;

the sample delivery channel, sample circulation channel, detection zone and capture zone channel forming a defined pathway through which the liquid sample flows from the through hole to the terminal end of the capture channel;

there being immobilized reagent in the capture zone channel which will react with said analyte to form a detectable product.

US 6,410,342 B1

METHOD AND APPARATUS FOR CONTROLLED PHOTOELUTION

Rhett L. Affleck, Lawrenceville, N.J.; Doug Hobbs, Lansdale, Pa.; Ilya Feygin, Mountainside; Gregory L. Kirk, Skillman, both of N.J.; James A. Connelly, Falls Township, Pa.; Ning Zhao, West Windsor; James P. Mueller, Cranbury, both of N.J., and Peter Kieselbach, Upper Black Eddy, Pa., assignors to Pharmacopeia, Inc., Princeton, N.J.

Filed Aug. 19, 1997, Appl. No. 914,861

Int. Cl. G01N *33/543;* **A61K** *38/00*

U.S. Cl. 436—518 **10 Claims**

1. In a method for photoeluting chemical compounds from a support, wherein photocleavable linkers that link said chemical compounds to said support are subjected to irradiation to release said chemical compounds, and wherein said chemical compounds that are released are then eluted, the improvement comprising:

terminating said irradiation after a period of time that:

is sufficient to release some but not all of said chemical compounds, wherein the chemical compounds that are released define a first released group;

is limited to prevent degradation, by further irradiation, of said first released group of chemical compounds; and

controlling elution temperature to a temperature that is within the range of about 20° C. to about 70° C.

US 6,410,343 B1

C-AXIS ORIENTED LEAD GERMANATE FILM AND DEPOSITION METHOD

Tingkai Li; Fengyan Zhang, both of Vancouver; Yoshi Ono, and Sheng Teng Hsu, both of Camas, all of Wash., assignors to Sharp Laboratories of America, Inc., Camas, Wash.

Filed Apr. 28, 1999, Appl. No. 301,420

This patent is subject to a terminal disclaimer.

Int. Cl. H01L *21/00*

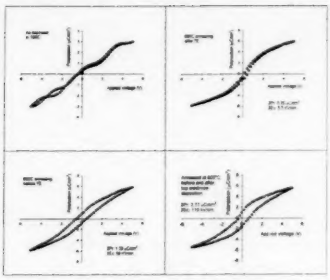
U.S. Cl. 438—3 **16 Claims**

1. In a lead germanium oxide (PGO) film, a method for forming a polycrystalline PGO film having a c-axis orientation on an integrated circuit (IC) film, the method comprising the steps of:

a) mixing $[Pb(thd)_2]$ and $[Ge(ETO)_4]$ to form a PGO mixture having a molar ratio in the range of approximately 4.5:3 to 5.5:3;

b) dissolving the mixture of Step a) with a solvent of tetrahydrofuran, isopropanol, and tetraglyme to form a precursor solution;

c) from the solution formed in Step b), creating a precursor gas;



The hysteresis loops of polycrystalline c-axis oriented $Pb_5Ge_3O_{11}$ films before and after the sectional annealing

d) decomposing the precursor gas formed in Step c) on the the integrated circuit (IC) film;

e) forming a PGO film, including a first phase of $Pb_5Ge_3O_{11}$; and

f) forming a primarily c-axis crystallographic orientation in the $Pb_5Ge_3O_{11}$ phase of the PGO film, whereby the ferroelectric properties of the PGO film are optimized.

US 6,410,344 B1

FERROELECTRIC RANDOM ACCESS MEMORY DEVICE AND METHOD FOR THE MANUFACTURE THEREOF

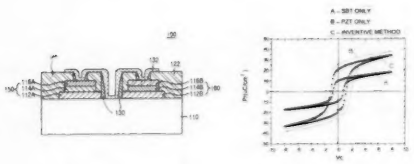
Choong-Heui Chung, Ichon-shi, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Ichon-shi, Rep. of Korea

Filed Dec. 14, 2000, Appl. No. 735,945

Claims priority, application Rep. of Korea, Dec. 28, 1999, 99-63777

Int. Cl. H01L *21/00*

U.S. Cl. 438—3 **5 Claims**



1. A method for manufacturing a FeRAM device, the method comprising the steps of:

a) preparing an active matrix provided with a transistor and diffusion regions;

b) forming a first capacitor structure on a portion of the active matrix, provided with a first capacitor thin film made of SBT;

c) forming a second capacitor structure on a remaining portion of the active matrix, provided with a second capacitor thin film thereof made of PZT; and

d) forming a metal interconnection on the first and the second capacitor structures, thereby electrically connecting the first and the second capacitor structures to one of the diffusion regions.

US 6,410,345 B1

METHOD FOR MANUFACTURING A FERROELECTRIC MEMORY DEVICE

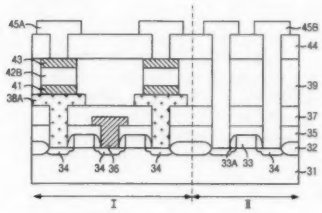
Won Moon, and Jeong-Ho Cho, both of Ichon-shi, Rep. of Korea, assignors to Hynix Semiconductor, Inc., Ishon-shi, Rep. of Korea

Filed Oct. 12, 2001, Appl. No. 975,086

Claims priority, application Rep. of Korea, May 11, 2001, 2001-25726

Int. Cl. H01L *21/00*

U.S. Cl. 438—3 **8 Claims**



1. A method for manufacturing a ferroelectric memory device, comprising steps of:

a) forming a first insulating layer on a semiconductor substrate;

b) opening a capacitor region by selectively patterning the first insulating layer;

c) forming a bottom electrode in the opened capacitor region by using a chemical vapor deposition (CVD) method;

d) forming a ferroelectric layer on a second insulating layer including the bottom electrode;

e) filling the ferroelectric layer on the capacitor region to a same height as that of the second insulating layer surface; and

f) forming a top electrode on the ferroelectric layer.

US 6,410,346 B1

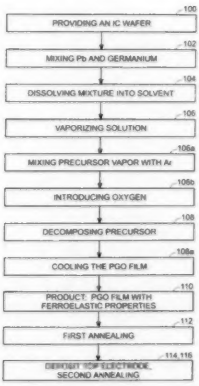
METHOD OF FORMING FERROELASTIC LEAD GERMANATE THIN FILMS

Tingkai Li; Fengyan Zhang, both of Vancouver; Yoshi Ono, and Sheng Teng Hsu, both of Camas, all of Wash., assignors to Sharp Laboratories of America, Inc., Camas, Wash.

Division of application No. 09/301,434, filed on Apr. 28, 1999. This application Dec. 6, 2001, Appl. No. 10,186.

Int. Cl. H01L *21/00*

U.S. Cl. 438—3 **15 Claims**



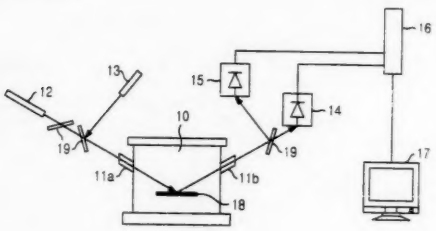
1. A method for forming a ferroelastic lead germanium oxide (PGO) film on an integrated circuit (IC) wafer comprising the steps of:

a) mixing $[Pb(thd)_2]$ and $[Ge(ETO)_4]$ to form a PGO mixture having a molar ratio in the range of approximately 2:1 to 4:1;
b) dissolving the mixture of Step a) with a solvent of tetrahydrofuran, isopropanol, and tetraglyme to form a precursor solution;
c) heating the solution formed in Step b) to create a precursor gas; and
d) decomposing the precursor gas formed in Step c) on the IC wafer to form a PGO thin film, including a first phase of Pb_5GeO_5, whereby the PGO film having ferroelastic properties is formed.

US 6,410,347 B1
REAL TIME EPITAXIAL GROWTH OF VERTICAL CAVITY SURFACE-EMITTING LASER USING A REFLECTOMETRY

Jong Hyeob Baek, and Bun Lee, both of Taejon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Taejon, Rep. of Korea

Filed Sep. 13, 1999, Appl. No. 395,032
Claims priority, application Rep. of Korea, Nov. 19, 1998, 98-49840
This patent is subject to a terminal disclaimer.
Int. Cl. H01L *21/20*
U.S. Cl. 438—7 **9 Claims**



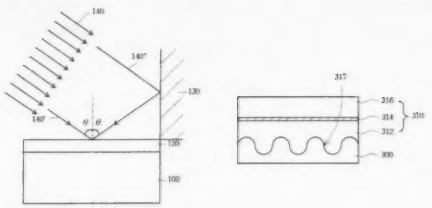
1. A method for manufacturing a surface emitting laser, comprising the steps of:
applying a main measuring laser beam to a semiconductor structure using a main measuring laser, wherein the semiconductor structure is fabricated to be the surface emitting laser and a wavelength of the main measuring laser is substantially the same with a wavelength of the surface emitting laser;
detecting a reflected signal of the main measuring laser beam;
estimating at least one period required for growing a specific thickness of a material layer by performing an analysis of the reflected signal; and
controlling growth time durations of material layers being subsequently grown, based on the result of the step of estimating.

US 6,410,348 B1
INTERFACE TEXTURING FOR LIGHT-EMITTING DEVICE

Tzer-Perng Chen, Hsinchu; Chih-Sung Chang, Taipei, and Holin Chang, Kaohsiung, all of Taiwan, assignors to United Epitaxxy Company, Ltd., Taiwan

Filed Aug. 1, 2000, Appl. No. 630,590
Int. Cl. H01L *21/00*
U.S. Cl. 438—9 **14 Claims**

1. A method of manufacturing an interface texturing for a light-emitting device, comprising the step of:
providing a substrate;
forming a photoresist layer over the substrate;

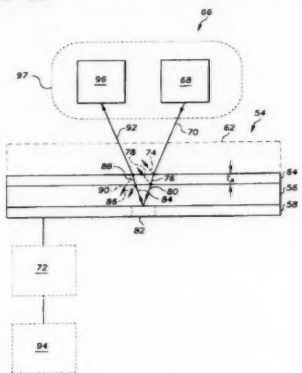


performing a first exposure step, which is to project a plurality of interference lines formed by a plurality of overlaid coherent light beams to the photoresist layer;
performing a step of develop to form a textured pattern on the surface of the photoresist layer; and
performing an etching process to transfer the photoresist pattern to the substrate.

US 6,410,349 B1
INTERNAL ANTI-REFLECTIVE COATING FOR INTERFERENCE REDUCTION

Michael R. Bruce; Victoria J. Bruce, and Gregory A. Dabney, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 30, 1999, Appl. No. 385,774
Int. Cl. H01L *21/66;* **G01R** *31/26*
U.S. Cl. 438—14 **22 Claims**



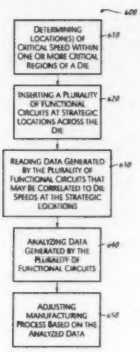
1. A method for analyzing an electronic circuit formed upon a front side surface of a semiconductor device having a back side opposite the front side, the back side having substrate, the method comprising:
forming at least one layer of antireflective material within the semiconductor substrate;
stimulating the circuit; and
responsive to stimulating the circuit, analyzing the electronic circuit.

US 6,410,350 B1
DETECTING DIE SPEED VARIATIONS

Mark Brandon Fuselier; Stephen Doug Ray; Michael James Dunn; Roger T. Williams, all of Austin, and Michael V. Fenske, Round Rock, all of Tex., assignors to Advanced Micro Devices, Austin, Tex.

Filed Jun. 29, 2000, Appl. No. 607,150
Int. Cl. H01L *21/66*
U.S. Cl. 438—14 **32 Claims**

1. A method of detecting speed variations across a die comprising the steps of:

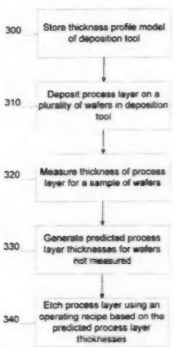

600
DETERMINING LOCATION(S) OF CRITICAL SPEED WITHIN ONE OR MORE CRITICAL REGIONS OF A DIE
610
INSERTING A PLURALITY OF FUNCTIONAL CIRCUITS AT STRATEGIC LOCATIONS ACROSS THE DIE
620
READING DATA GENERATED BY THE PLURALITY OF FUNCTIONAL CIRCUITS THAT MAY BE CORRELATED TO DIE SPEEDS AT THE STRATEGIC LOCATIONS
630
ANALYZING DATA GENERATED BY THE PLURALITY OF FUNCTIONAL CIRCUITS
640
ADJUSTING MANUFACTURING PROCESS BASED ON THE ANALYZED DATA
650

determining at least one location of at least one critical region of said die;

inserting a plurality of functional circuits at strategic locations across said die; wherein each of said plurality of functional circuits generate data correlated to die speeds at said strategic locations; and

reading data generated by said plurality of functional circuits that is correlated to die speeds at said strategic locations, wherein speed variations across said die are detected based on said data generated by said plurality of functional circuits.

US 6,410,351 B1
METHOD AND APPARATUS FOR MODELING THICKNESS PROFILES AND CONTROLLING SUBSEQUENT ETCH PROCESS
Christopher A. Bode, and Anthony J. Toprac, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Austin, Tex.
Filed Jul. 13, 2000, Appl. No. 615,481
Int. Cl. H01L *21/4763*
U.S. Cl. 438—14 **18 Claims**


300
Store thickness profile model of deposition tool
310
Deposit process layer on a plurality of wafers in deposition tool
320
Measure thickness of process layer for a sample of wafers
330
Generate predicted process layer thicknesses for wafers not measured
340
Etch process layer using an operating recipe based on the predicted process layer thicknesses

1. A method for controlling wafer uniformity, comprising:

storing a thickness profile model of a deposition tool;

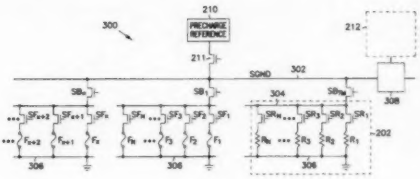
concurrently depositing a process layer on a plurality of wafers in the deposition tool;

measuring the thickness of the process layer for a sample of the wafers;

generating predicted process layer thicknesses for the wafers not measured based on the process layer thickness measurements and the thickness profile model; and

etching the process layer in an etching tool in accordance with an operating recipe, the operating recipe being based on the predicted process layer thicknesses.

US 6,410,352 B2
APPARATUS AND METHOD FOR TESTING FUSES
Tim Damon, Meridian, and Phillip E. Byrd, Boise, both of Id., assignors to Micron Technology, Inc., Boise, Id.
Division of application No. 09/146,688, filed on Sep. 3, 1998. This application May 14, 2001, Appl. No. 854,541.
Int. Cl. H01L *21/66*
U.S. Cl. 438—14 **28 Claims**

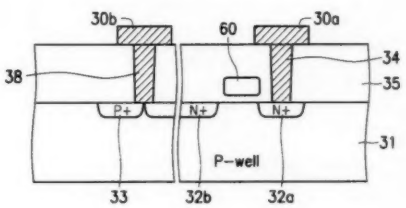


1. A circuit for testing fuses in an integrated circuit comprising:

a control resistor electrically interposed between a first supply node and a second supply node; and

a testing circuit having an input and an access to a reference in the testing circuit, wherein the input of the testing circuit is in electrical communication with the first supply node.

US 6,410,353 B1
CONTACT CHAIN FOR TESTING AND ITS RELEVANTLY DEBUGGING METHOD
Tsung-Liang Tsai, Hsinchu, Taiwan, assignor to ProMOS Technologies Inc., Hsinchu, Taiwan
Filed May 23, 2001, Appl. No. 862,485
Int. Cl. G01R *31/26;* **H01L** *21/66*
U.S. Cl. 438—14 **12 Claims**



4. A debugging method for determining a failed contact structure among a plurality of contact structures, the contact structures being located on a substrate Of a first conductive type, a dielectric layer being on the substrate, each contact structure comprising a contact hole in the dielectric layer and conductive material in the contact hole, and serving to electrically contact with a first doped layer of a second conductive type, wherein the first doped layer selectively coupled to the substrate is formed on the substrate, the debugging method comprises:

coupling the substrate to ground;

selecting to couple the first doped layer to the substrate;

scanning the contact structures by a beam of charge carriers to obtain first surface responses corresponding to the contact structures; and

retrieving a first specific contact structure as the failure contact structure whose first response is unfit for a predetermined requirement.

US 6,410,354 B1
SEMICONDUCTOR SUBSTRATE TEST DEVICE AND METHOD

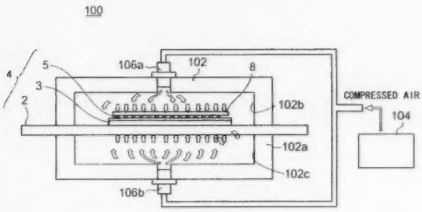
Shigeyuki Maruyama; Naoyuki Watanabe; Daisuke Koizumi, all of Kawasaki, and Akira Sawamori, Kasugai, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 18, 2001, Appl. No. 906,675

Claims priority, application Japan, Jul. 31, 2000, 2000-232304

Int. Cl. H01L *21/00*

U.S. Cl. 438—14 **24 Claims**



1. A semiconductor substrate test device comprising:

a contactor having contact electrodes formed on a first face thereof, the contact electrodes being connected with terminals formed on a first face of a semiconductor substrate; and

a drag supply part supplying a drag to prevent a deformation of said contactor, the deformation being caused by a contact force generated when the contact electrodes are placed in contact with the terminals.

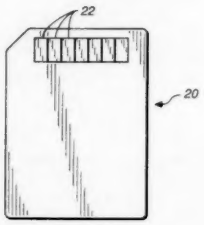
US 6,410,355 B1
SEMICONDUCTOR PACKAGE USING TERMINALS FORMED ON A CONDUCTIVE LAYER OF A CIRCUIT BOARD

Robert F. Wallace, Sunnyvale, Calif., assignor to Sandisk Corporation, Sunnyvale, Calif.

Division of application No. 09/096,140, filed on Jun. 11, 1998, now Pat. No. 6,040,622. This application Jan. 19, 2000, Appl. No. 487,106.

Int. Cl. H01L *21/70*

U.S. Cl. 438—15 **26 Claims**



1. A method of making a memory card comprising:

attaching a set of circuit elements to a circuit board, the set of circuit elements including at least one integrated circuit and passive components, the circuit board having test connections and terminals on one end of the circuit board, the test connections being connected to test the set of circuit elements;

testing the set of circuit elements using the test connections;

thereafter, severing the end of the circuit board having the test connections and terminals; and

thereafter, packaging the circuit board.

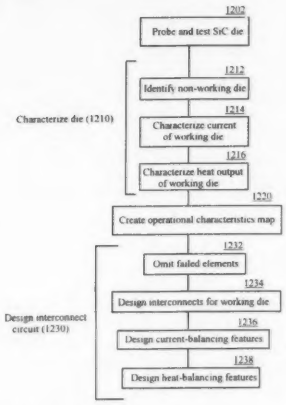
US 6,410,356 B1
SILICON CARBIDE LARGE AREA DEVICE FABRICATION APPARATUS AND METHOD

Robert John Wojnarowski, Ballston Lake; Ernest Wayne Balch, Ballston Spa, and Leonard Richard Douglas, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 7, 2000, Appl. No. 520,751

Int. Cl. H01L *21/66;* **G01R** *31/26*

U.S. Cl. 438—15 **17 Claims**



1. A method for interconnecting high-temperature silicon carbide (SiC) devices on a substrate, comprising:

empirically measuring operational characteristics of the devices;

characterizing operational characteristics of the devices in an operational characteristics map, the operational characteristics map including identification of non-working devices and working devices;

using the operational characteristics map to design interconnection paths for interconnecting the working devices and excluding the non-working devices;

disposing a temporary polymer layer over the devices;

forming via holes through the temporary polymer layer to bonding pads of the devices;

applying a current-balancing resistive metal over the temporary polymer layer in accordance with the designed interconnection paths;

establishing via connections between the current-balancing resistive metal and the bonding pads;

applying a high-temperature shunt metal over the current-balancing resistive metal in accordance with the designed interconnection paths;

removing selected portions of the shunt metal to create notches in the shunt metal for altering electrical resistances in accordance with the designed interconnection paths; and

removing the temporary polymer layer.

US 6,410,357 B1
STRUCTURE OF CRITICAL DIMENSION BAR

Kun-Yuan Chang, Changhua Hsien, and Chia-Ming Cheng, Chiayi Hsien, both of Taiwan, assignors to United Microelectronics Corp., Hsinchu, Taiwan

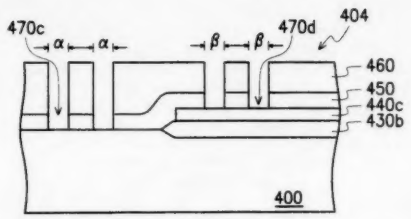
Division of application No. 09/715,356, filed on Nov. 17, 2000. This application Jul. 17, 2001, Appl. No. 907,419.

Claims priority, application Taiwan, Nov. 14, 2000, 89124068 A

Int. Cl. H01L *21/66*

U.S. Cl. 438—16 **12 Claims**

1. A method of monitoring critical dimension deviation, used for a substrate having a plurality of dies and a test region between the dies, the method comprising steps of:



forming a base layer on a portion of the substrate within the test region, and simultaneously forming a patterned base layer on the substrate within each of the dies, the base layer and the patterned base layer being made of same material and having same thicknesses, wherein a region outside the base layer within the test region being defined as a lower region;

forming a patterned critical material layer covering the dies and the test region with equal uniform thickness, wherein the critical material layer on each of the die comprises a die pattern, the critical material layer on the base layer within the test region comprises a first test pattern, and the critical material layer on the lower region comprises a second test pattern, and the die pattern, the first and second test pattern are obtained from a die photomask pattern, a first test photomask pattern and a second test photomask pattern with equal pattern width; measuring critical dimensions of the first and the second test patterns; and

comparing the measured critical dimensions of the first and the second test patterns for obtaining deviations in the critical dimensions of the die patterns.

US 6,410,358 B1

MANUFACTURING METHOD FOR REFLECTION TYPE LIQUID CRYSTAL DISPLAY

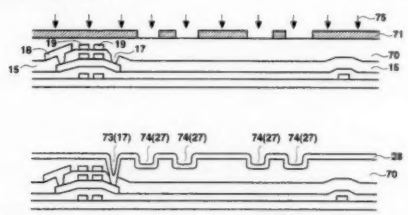
Kazuto Noritake, Gifu, and Toshifumi Yamaji, Aichi, both of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Jul. 14, 2000, Appl. No. 615,608

Claims priority, application Japan, Jul. 14, 1999, 11-200600

Int. Cl. H01L *21/00;21/84*

U.S. Cl. 438—29 **9 Claims**



3. A manufacturing method for a reflection type liquid crystal display having a reflection film for reflecting light having passed through a liquid crystal layer, the method comprising:

forming a thin film transistor on a substrate;

forming a photosensitive resin film on the thin film transistor;

exposing the photosensitive resin film with a first unit exposure light amount via a first mask;

exposing the photosensitive resin film with a second unit exposure light amount via a second mask;

developing the photosensitive resin film subjected to two exposures thereby forming two types of concaves having different depths; and

forming a film using a reflective material on the photosensitive resin developed to have two types of concaves, thereby forming the reflection film;

wherein the photosensitive resin film constitutes an insulating film, the reflection film is a reflection electrode having a size corresponding to a pixel, and

the reflection electrode is electrically connected to the thin film transistor, and

wherein the second unit exposure light amount is larger than the first unit exposure light amount,

the concave formed using the first mask constitutes a concave formed on a surface of the reflection electrode, and

the concave formed using the second mask constitutes a contact hole for electrically connecting the reflection electrode and the thin film transistor.

US 6,410,359 B2

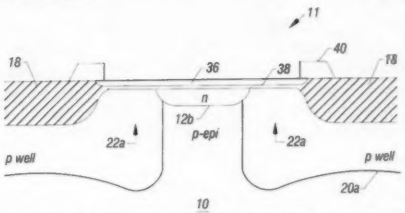
REDUCED LEAKAGE TRENCH ISOLATION

Kevin M. Connolly; Jung S. Kang, both of Chandler, Ariz.; Berni W. Landau, Beaverton, Oreg.; James E. Breisch, Chandler; Akira Kakizawa, Phoenix, both of Ariz.; Joseph W. Parks, Jr., Hillsboro, Oreg.; Mark A. Beiley, Chandler; Zong-Fu Li, Gilbert, both of Ariz.; Cory E. Weber, Beaverton, and Shaofeng Yu, Lake Oswego, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Division of application No. 09/310,423, filed on May 12, 1999, now Pat. No. 6,215,165, which is a continuation-in-part of application No. 09/098,881, filed on Jun. 17, 1998. This application Mar. 26, 2001, Appl. No. 817,639.

Int. Cl. H01L *21/00*

U.S. Cl. 438—48 **6 Claims**



1. A method of forming a photosensitive device comprising:

forming a first region of a first conductivity type in a semiconductor structure of a second conductivity type opposite said first conductivity type;

forming a trench in said structure;

forming a second region of said second conductivity type between said trench and said first region; and

forming a silicon region over said first region.

US 6,410,360 B1

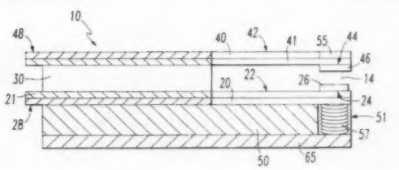
LAMINATE-BASED APPARATUS AND METHOD OF FABRICATION

Robert W. Steenberge, Poway, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jan. 26, 1999, Appl. No. 237,365

Int. Cl. B81C *3/00;* **H01H** *50/00*

U.S. Cl. 438—52 **33 Claims**



1. A method of fabricating a laminate-based electromechanical relay device, comprising:

providing at least one first layer of laminate having at least one layer of electrically conductive material adherent thereto;

forming at least one stationary contact from the at least one layer of electrically conductive material;

providing at least one intermediate layer of laminate adjacent to the first layer of laminate;

providing at least one second layer of laminate atop the at least one intermediate layer, the at least one second layer having at least one layer of electrically conductive material adherent thereto;

removing a portion of the at least one intermediate layer adjacent to the at least one stationary contact to form an air gap between said at least one first layer and at least one second layer;

forming at least one moving contact from the at least one second layer and the at least one layer of electrically conductive material adherent thereto, the at least one moving contact adjacent to the air gap, such that the at least one second layer and the at least one layer of electrically conductive material adherent thereto are deflectable such that the at least one moving contact is capable of contacting the stationary contact;

stacking the at least one first, intermediate, and second layers in an order to provide a stack; and

bonding the stack to form a unitary laminate body.

US 6,410,361 B2

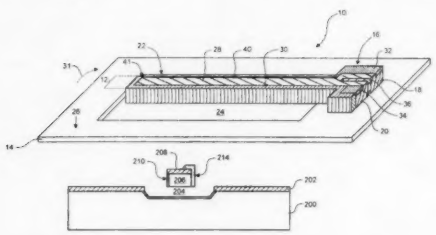
METHODS OF FABRICATING IN-PLANE MEMS THERMAL ACTUATORS

Vijayakumar R. Dhuler, Raleigh; Edward Hill, Chapel Hill, and Allen Cowen, Cary, all of N.C., assignors to JDS Uniphase Corporation, Research Triangle Park, N.C.

Division of application No. 09/395,068, filed on Sep. 13, 1999, now Pat. No. 6,211,598. This application Feb. 6, 2001, Appl. No. 777,749.

Int. Cl. H01L *21/00;* **H02N** *1/04;* **H01H** *37/00;61/00;37/52*

U.S. Cl. 438—54 **10 Claims**



1. A method for fabricating a self-contained MEMS thermal actuator having in-plane actuation capability, the method comprising the steps of:

attaching a generally planar surface of a first semiconductor substrate to a generally planar surface of a second semiconductor substrate;

defining a portion of a MEMS thermal actuator in the second substrate, the portion of the MEMS thermal actuator comprising a portion of at least one anchor affixed to the first semiconductor substrate and a first layer of a composite beam;

doping a region of the first layer of the composite beam so as to define a conductive path in the first layer of the composite beam; and

disposing a second layer on the undoped region of the first layer of the composite beam, the second layer comprising a material that responds differently to thermal actuation, such that the first and second layers of the composite beam will effectuate actuation of said composite beam along a predetermined path that extends substantially parallel to the generally planar surface of said microelectronic substrate.

US 6,410,362 B1

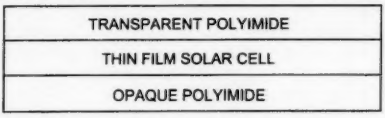
FLEXIBLE THIN FILM SOLAR CELL

Edward J. Simburger, Agoura; Michael J. Meshishnek, El Segundo; David G. Gilmore, West Hollywood; Dennis A. Smith, Glendora; Margaret H. Abraham, Los Angeles, all of Calif.; Frank R. Jeffrey, Ames, Iowa, and Paul A. Gierow, Madison, Ala., assignors to The Aerospace Corporation, El Segundo, Calif.

Filed Aug. 28, 2000, Appl. No. 649,194

Int. Cl. H01L *31/048*

U.S. Cl. 438—66 **4 Claims**



THERMAL EMMISIVE THIN FILM SOLAR CELL

1. A method of manufacturing an integral thin film solar cell array, the method comprising the steps of,

depositing thin film solar cells on a flexible sheet of polyimide becoming a first thermal emissive covering layer for the thin film solar cells for communicating solar illumination to the thin film solar cells and for heat rejection and forming a flexible sheet of solar cells,

applying a solvent based thermal emissive covering layer onto the thin film solar cells of the flexible sheet of solar cells, and

curing the solvent based thermal emissive covering layer into a second thermal emissive covering layer for forming the integral thin film solar cell array.

US 6,410,363 B1

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING SAME

Takayuki Tani; Takashi Sekibata, and Haruo Hyodo, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

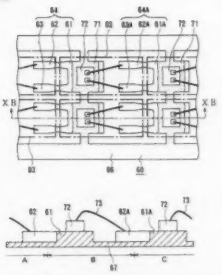
Division of application No. 09/036,783, filed on Mar. 19, 1998, now abandoned. This application Apr. 5, 2000, Appl. No. 543,861.

Claims priority, application Japan, Mar. 10, 1997, 9-55166; Nov. 28, 1997, 9-327967

This patent is subject to a terminal disclaimer.

Int. Cl. H01L *21/44;21/48;21/50*

U.S. Cl. 438—112 **8 Claims**



1. A method of manufacturing a semiconductor device, comprising:

providing a lead frame including an array of mounting portions connected by joint bars, each of the mounting portions having an island for mounting a semiconductor chip thereon and having a plurality of lead terminals extending from the island, wherein the lead terminals comprise external connection terminals for forming an electrical connection to another semiconductor chip mounted on an adjacent island along the array of mounting portions;

mounting a semiconductor chip on a first surface of the island;

electrically connecting the semiconductor chip to the lead terminals extending from an adjacent island along the array;

forming a resin layer so as to cover the semiconductor chip, the first surface of the island, and first surfaces of the lead terminals, wherein a second surface of the island opposite the first surface of the island and second surfaces of the lead terminals opposite the first surfaces of the lead terminals are free of the resin layer so as to be exposed; and

separating the lead frame so as to form a package including a region surrounding the island and the lead terminals electrically connected to the semiconductor chip mounted on the island.

US 6,410,364 B1

SEMICONDUCTOR DEVICE, METHOD OF CONNECTING A SEMICONDUCTOR CHIP, CIRCUIT BOARD, AND ELECTRONIC EQUIPMENT

Nobuaki Hashimoto, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

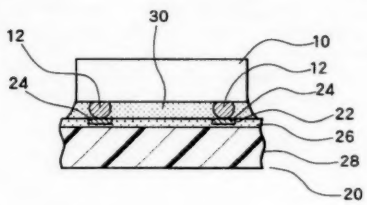
PCT No. PCT/JP99/04787, § 371 Date May 25, 2000, § 102(e) Date May 25, 2000, PCT Pub. No. WO00/19516, PCT Pub. Date Apr. 6, 2000

PCT Filed Sep. 3, 1999, Appl. No. 555,141

Claims priority, application Japan, Sep. 30, 1998, 10-292934

Int. Cl. H01L *21/44*

U.S. Cl. 438—118 **27 Claims**



1. A semiconductor device comprising:

a support member on which is formed an interconnecting pattern including a land;

a semiconductor chip to be bonded face-down to the support member and having a bump that is disposed on the land; and

resin which provides adhesion between the semiconductor chip and the support member and which contracts on hardening, to cause the land and the bump to be pressure-bonded by stress due to the hardening contraction,

wherein the stress is partially absorbed by elastic deformation of the support member, without changing the shape of the land.

US 6,410,365 B1

SEMICONDUCTOR DEVICE WITH TWO STACKED CHIPS IN ONE RESIN BODY AND METHOD OF PRODUCING

Youichi Kawata, Higashiyamato; Kouji Koizumi, Hinodemachi; Michiaki Sugiyama, Tokyo; Atsushi Fujishima, Kodaira; Yasuyuki Nakajima, Akishima, and Takatoshi Hagiwara, Iruma, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi ULSI Systems Co., Ltd., Kodaira, both of Japan

Filed Jun. 1, 1999, Appl. No. 322,915

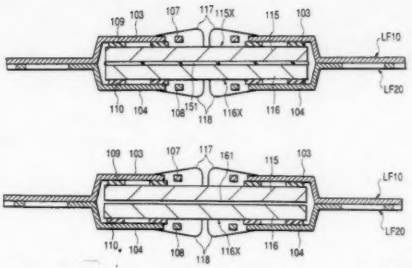
Claims priority, application Japan, Jun. 1, 1998, 10-151254; Mar. 2, 1999, 11-053969

Int. Cl. H01L *21/50*

U.S. Cl. 438—123 **4 Claims**

1. A method of producing a semiconductor device comprising the steps of:

providing first and second semiconductor chips each having a main surface comprising a semiconductor element and a plurality of external terminals, and a lower surface opposing said main surface, wherein said first and second semiconductor chips are warped,



providing a first lead frame comprising outer portions and inner portions extending from said outer portions, and a second lead frame comprising outer portions and inner portions extending from said outer portions,

fixing the main surface of said first semiconductor chip to the inner portions of said first lead frame, electrically connecting the plurality of external terminals of said first semiconductor chip to the inner portions of said first lead frame, fixing the main surface of said second semiconductor chip to the inner portions of said second lead frame, and electrically connecting the plurality of external terminals of said second semiconductor chip to the inner portions of said second lead frame,

disposing said first and second semiconductor chips, and the inner portions of said first lead frame and said second lead frame, within the interior of a mold cavity such that the lower surfaces of said first and second semiconductor chips are facing each other, and

pressure injecting a resin comprising a mixture of fillers into said mold cavity so as to form a seal, wherein:

a gap between the lower surface of said first semiconductor chip and the lower surface of said second semiconductor chip is maintained wider than a diameter of a largest particle of said fillers.

US 6,410,366 B1

SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF, CIRCUIT BOARD AND ELECTRONIC EQUIPMENT

Nobuaki Hashimoto, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

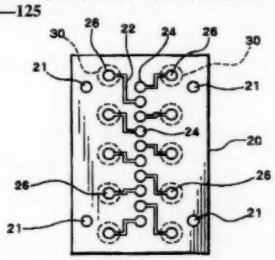
PCT No. PCT/JP99/04786, § 371 Date May 25, 2000, § 102(e) Date May 25, 2000, PCT Pub. No. WO00/19515, PCT Pub. Date Apr. 6, 2000

PCT Filed Sep. 3, 1999, Appl. No. 555,135

Claims priority, application Japan, Sep. 30, 1998, 10-292933

Int. Cl. H01L *21/44;21/48;21/50;23/48;23/52;29/40;* **H05K** *1/00;1/18;7/02;7/06;7/08;7/10;7/12*

U.S. Cl. 438—125 **44 Claims**



23. A method of manufacturing a semiconductor device, comprising:

a step of providing a semiconductor chip having a plurality of electrodes aligned to be concentrated on a straight line;

a step of providing a substrate on which is formed an interconnect pattern having bonding portions formed in positions corresponding to the electrodes of the semiconductor chip, and lands electrically connected to the bonding portions, the lands for outer electrical connection;

a step of subjecting the semiconductor chip to face-down bonding to connect the electrodes to the bonding portions; and

a step of providing at least one support between the semiconductor chip and the substrate, of approximately the same height as the total thickness of the electrodes and the bonding portions.

US 6,410,367 B2

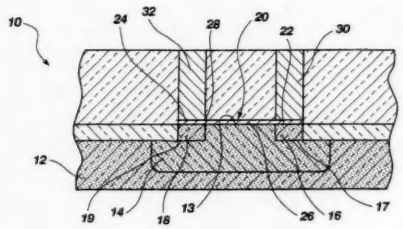
FUSE FOR USE IN A SEMICONDUCTOR DEVICE, AND SEMICONDUCTOR DEVICES INCLUDING THE FUSE

Kenneth W. Marr, and Michael P. Violette, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Division of application No. 09/293,192, filed on Apr. 16, 1999. This application Jan. 12, 2001, Appl. No. 759,852.

Int. Cl. H01L *21/82*

U.S. Cl. 438—132 **33 Claims**



1. A method for fabricating a fuse of a semiconductor device, comprising:

doping a first region of a semiconductor substrate to have a first conductivity type;

doping at least two spaced apart second regions of said semiconductor substrate adjacent said first region to have a second conductivity type;

disposing a layer comprising metal silicide adjacent said semiconductor substrate, including said first region and said at least two spaced apart second regions; and

patterning said layer to define at least two terminal regions of the fuse, each of said at least two terminal regions disposed adjacent a corresponding one of said at least two spaced apart second regions, a conductive region of the fuse disposed between said at least two terminal regions, and a narrowed region of the fuse disposed between said conductive region and one of said at least two terminal regions and positioned adjacent a boundary between one of said at least two spaced apart second regions and said first region.

US 6,410,368 B1

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WITH TFT

Ritsuko Kawasaki; Kenji Kasahara, and Hisashi Ohtani, all of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Japan

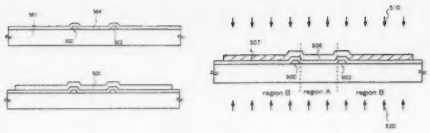
Filed Oct. 26, 2000, Appl. No. 696,165

Claims priority, application Japan, Oct. 26, 1999, 11-304719

Int. Cl. H01L *21/00;21/84*

U.S. Cl. 438—145 **48 Claims**

1. A method of manufacturing a semiconductor device, comprising the steps of:



forming a stripe-like first insulating layer over one surface of a light-transparent substrate;

forming an island-like semiconductor layer over the stripe-like first insulating layer so that the island-like semiconductor layer crosses the stripe-like first insulating layer; and

irradiating a front surface and a back surface of the island-like semiconductor layer with laser light to crystallize the island-like semiconductor layer.

US 6,410,369 B1

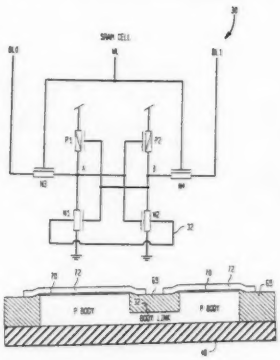
SOI-BODY SELECTIVE LINK METHOD AND APPARATUS

Roy Childs Flaker, deceased, late of Essex Junction, Vt., by Scott Flaker, heir; Louis L. Hsu, Fishkill, N.Y.; Fariborz Assaderaghi, Mahopac, N.Y., and Jack A. Mandelman, Stormville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of application No. 09/063,822, filed on Apr. 22, 1998. This application Jun. 12, 2000, Appl. No. 591,511.

Int. Cl. H01L *21/00*

U.S. Cl. 438—149 **8 Claims**



1. A method of manufacturing a silicon-on-insulator (SOI) structure comprising the steps of:

providing an SOI wafer including a silicon layer having an original thickness dimension formed upon an isolation oxidation layer;

providing at least two p-type bodies of at least two SOI field effect transistors (PFETs);

providing at least two n-type bodies of at least two SOI field effect transistors (NFETs); and

providing a conductive SOI body link formed in the silicon layer of the SOI wafer adjacent the isolation oxidation layer for selectively connecting desired bodies of either the p-type SOI FETs or the n-type SOI FETs and for allowing the connected bodies to float.

US 6,410,370 B1

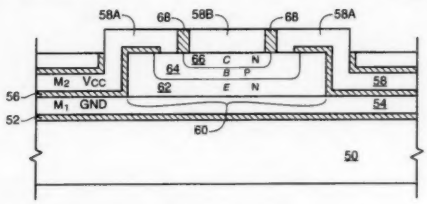
CAPACITOR FOR A SEMICONDUCTOR DEVICE

Anthony Grass, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Division of application No. 09/034,213, filed on Feb. 27, 1998, now Pat. No. 6,090,647, which is a continuation of application No. 08/614,713, filed on Mar. 13, 1996, now Pat. No. 5,726,485. This application Jul. 18, 2000, Appl. No. 618,208.

Int. Cl. H01L *21/00*

U.S. Cl. 438—151 **19 Claims**



1. A semiconductor device comprising:

a semiconductor substrate assembly assembly;

a power plane and a ground plane overlying said substrate each coplanar with the other and separated by a distance thereby forming a pair of capacitor plates;

a semiconductor layer overlying said power and ground planes comprising first, second, third, and fourth doped regions therein, wherein said first doped region is electrically coupled with said power plane and said fourth doped region is electrically coupled with said ground plane.

US 6,410,371 B1

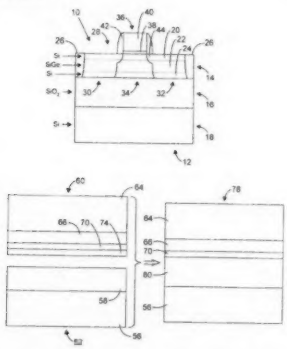
METHOD OF FABRICATION OF SEMICONDUCTOR-ON-INSULATOR (SOI) WAFER HAVING A SI/SIGE/SI ACTIVE LAYER

Bin Yu, Cupertino; William G. En, Milpitas; Judy Xilin An, San Jose, and Concetta E. Riccobene, Mountain View, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 26, 2001, Appl. No. 794,884

Int. Cl. H01L *21/84*

U.S. Cl. 438—151 **13 Claims**



1. A method of forming a semiconductor-on-insulator (SOI) wafer, comprising the steps of:

providing a first wafer, the first wafer having a silicon substrate and an oxide layer disposed thereon;

providing a second wafer, the second wafer having a silicon substrate, the substrate of the second wafer having a silicon-germanium layer disposed thereon, a silicon layer disposed on the silicon-germanium layer and an oxide layer disposed on the silicon layer;

wafer bonding the first and second wafers; and

removing an undesired portion of the substrate from the second wafer to form an upper silicon layer.

US 6,410,372 B2

MANUFACTURE OF THIN FILM TRANSISTORS

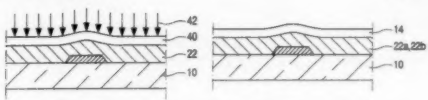
Andrew J. Flewitt, Cambridge, United Kingdom, assignor to Koninklijke Philips Electronics N.V., Eindhoven, Netherlands

Filed Jun. 14, 2001, Appl. No. 881,601

Claims priority, application United Kingdom, Jul. 18, 2000, 0017471

Int. Cl. H01L *21/00;21/84*

U.S. Cl. 438—158 **6 Claims**



1. A method of manufacturing a transistor, comprising:

(i) defining a gate conductor over an insulating substrate;

(ii) forming a gate insulator layer over the gate conductor;

(iii) depositing a first microcrystalline silicon layer over the gate insulator layer;

(iv) exposing the microcrystalline silicon layer to a nitrogen plasma, thereby forming silicon nitride, and substantially maintaining the crystalline structure;

(v) repeating steps (iii) and (iv) for a plurality of microcrystalline silicon layers;

(vi) forming a further microcrystalline silicon layer over the exposed layers, the further layer defining the semiconductor body of the transistor; and

(vi) defining a source and drain structure over the transistor body.

US 6,410,373 B1

METHOD OF FORMING POLYSILICON THIN FILM TRANSISTOR STRUCTURE

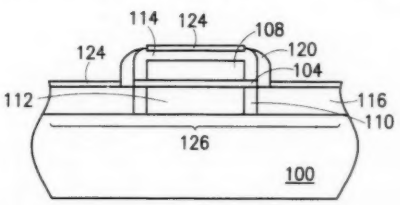
Ting-Chang Chang; Hsiao-Wen Zan, and Po-Sheng Shih, all of Hsinchu, Taiwan, assignors to United Microelectronics Corp., Hsinchu, Taiwan

Filed Apr. 30, 2001, Appl. No. 845,438

Claims priority, application Taiwan, Apr. 24, 2001, 90109736

Int. Cl. H01L *21/00;21/84*

U.S. Cl. 438—164 **16 Claims**



1. A method of forming polysilicon thin film transistor, comprising:

providing an insulating substrate;

forming an amorphous silicon channel layer over the substrate;

patterning out an active region in the amorphous silicon channel layer by applying photolithographic and etching processes;

forming an oxide layer over the amorphous silicon channel layer;

forming a conductive layer over the oxide layer;

patterning the conductive layer to form a gate electrode;

forming a lightly doped source/drain region in the amorphous silicon channel layer while using the gate electrode as a mask;

performing a selective deposition of conductive material over the gate electrode to form a spacer that encloses the gate electrode;

forming a source/drain region in the amorphous silicon channel layer while using the spacer and the gate electrode as a mask;

removing a portion of the oxide layer over the source/drain region;

forming an isolation spacer on a sidewall of the spacer but exposing a top section of the spacer;

forming a self-aligned silicide layer over the source/drain region and the top section of the spacer; and

performing a metal-induced lateral crystallization process so that the amorphous silicon channel layer is transformed into a metal-induced lateral crystallization polysilicon channel layer.

US 6,410,374 B1

METHOD OF CRYSTALLIZING A SEMICONDUCTOR LAYER IN A MIS TRANSISTOR

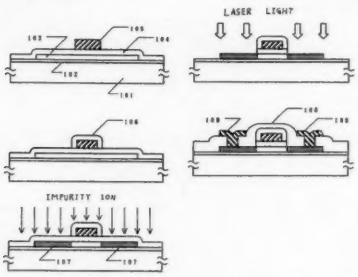
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laborartory Co., Ltd., Kanagawa-ken, Japan

Division of application No. 08/665,840, filed on Jun. 17, 1996, which is a continuation of application No. 08/171,402, filed on Dec. 22, 1993, now abandoned. This application Sep. 20, 1999, Appl. No. 409,662.

Claims priority, application Japan, Dec. 26, 1992, 4-359156; Dec. 26, 1992, 4-359157; Dec. 26, 1992, 4-359158

Int. Cl. H01L *21/00;21/84;21/76*

U.S. Cl. 438—166 **58 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor layer on an insulating surface;

irradiating said semiconductor layer with a laser beam to crystallize said semiconductor layer,

wherein said laser beam is a third harmonic of an Nd:YAG laser, said beam having a wavelength of 354 nm.

US 6,410,375 B1

METHODS OF FORMING TRANSISTORS INCLUDING GATE DIELECTRIC LAYERS HAVING DIFFERENT NITROGEN CONCENTRATIONS

Tae-jung Lee, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Jul. 21, 1999, Appl. No. 358,574

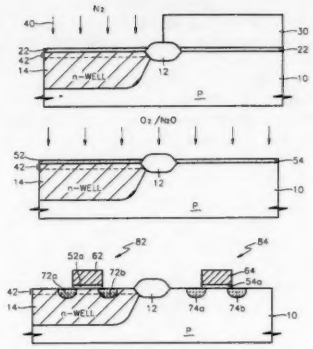
Claims priority, application Rep. of Korea, Jul. 21, 1998, 98-29290

Int. Cl. H01L *21/8238*

U.S. Cl. 438—199 **25 Claims**

1. A method of forming an electronic device on a semiconductor substrate, the method comprising the steps of:

forming a first field effect transistor on the substrate wherein the first field effect transistor includes a first gate dielectric layer having a first nitrogen concentration wherein the first field effect transistor defines a p-type channel so that the first field effect transistor is a PMOS transistor; and



forming a second field effect transistor on the substrate wherein the second field effect transistor includes a second gate dielectric layer having a second nitrogen concentration lower than the first nitrogen concentration wherein the second field effect transistor defines an n-type channel so that the second field effect transistor is an NMOS transistor.

US 6,410,376 B1

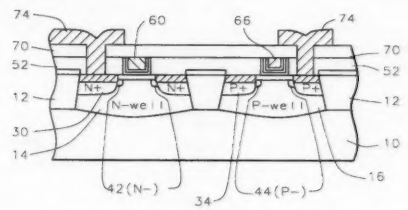
METHOD TO FABRICATE DUAL-METAL CMOS TRANSISTORS FOR SUB-0.1 μM ULSI INTEGRATION

Chit Hwei Ng, and Chaw Sing Ho, both of Singapore, Singapore, assignors to Chartered Semiconductor Manufacturing Ltd., Singapore, Singapore

Filed Mar. 2, 2001, Appl. No. 797,555

Int. Cl. H01L *21/8238*

U.S. Cl. 438—199 **34 Claims**



1. A method of forming dual-metal gate CMOS transistors in the fabrication of integrated circuits comprising:

providing an NMOS active area and a PMOS active area of a semiconductor substrate separated by isolation regions;

forming a pad oxide layer overlying said semiconductor substrate in each of said active areas;

depositing a nitride layer overlying said pad oxide layer;

patterning said nitride layer to form a first dummy gate in each of said active areas;

implanting ions to form source/drain regions in each of said active areas not covered by said first dummy gates;

isotropically etching said first dummy gates to form second dummy gates thinner than said first dummy gates;

implanting ions to form lightly doped source/drain regions in each of said active areas not covered by said second dummy gates;

forming dielectric spacers on sidewalls of said second dummy gates;

thereafter siliciding said source/drain regions;

depositing a dielectric layer overlying said second dummy gates and silicided said source/drain regions and planarizing said dielectric layer to said second dummy gates;

thereafter removing said second dummy gates leaving gate openings in said dielectric layer;

depositing a gate dielectric layer within said gate openings;

depositing a first diffusion barrier layer overlying said gate dielectric layer;

thereafter forming a mask over said PMOS active area;

depositing a first metal layer in said gate opening in said NMOS active area and planarizing said first metal layer to said mask;

thereafter removing said mask;

depositing a second metal layer in said gate opening in said PMOS active area; and

polishing away said first and second metal layers to said dielectric layer thereby forming a first metal gate within said gate opening in said NMOS active area and forming a second metal gate within said gate opening in said PMOS active area to complete formation said of dual-metal gate CMOS transistors in the fabrication of an integrated circuit.

US 6,410,377 B1

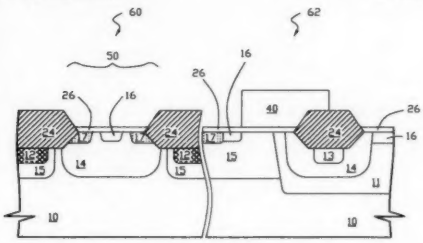
METHOD FOR INTEGRATING CMOS SENSOR AND HIGH VOLTAGE DEVICE

Ching-Chun Hwang, 11F-1B, No. 169-10, Sec. 3, His-Tun Rd., Taichung City, and Sheng-Hsiung Yang, 26, Alley 5, Lane 10, Min-Yu 2nd St., Hsin-Chu City, both of Taiwan

Filed Nov. 6, 2000, Appl. No. 707,128

Int. Cl. H01L *21/8238;21/8249;21/8234;21/00*

U.S. Cl. 438—200 **19 Claims**



1. A method for integrating a CMOS sensor and a high voltage device, said method comprising:

s providing a substrate of a first conductive type with a first region and a second region;

forming a first well of a second conductive type in said substrate of said second region, wherein said second conductive type being opposite to said first conductive type;

forming a plurality of field oxide regions on said substrate to define a first active region of said sensor in said first region and a second active region of said high voltage device in said second region, wherein said first well being in a lateral of said substrate of said second active region, and one of said field oxide regions being floating on said first well;

forming a first doped region of said second conductive type in said substrate of said first active region of said sensor and in said substrate of said second active region of said first well, wherein said first doped region in said second region being capping said field oxide region in said first well;

forming a second well of said first conductive type in said substrate, wherein said second well in said first region being under each one of said field oxide regions, and said second well in said second region being adjacent to said first well in said second active region;

forming a gate oxide layer on said substrate except said field oxide regions;

forming a polysilicon gate electrode covering a portion of said second well and a portion of said first well in said second active region, wherein said polysilicon gate electrode being covering a portion said field oxide region on said first well; and

forming a source region and a drain region of said second conductive type in said substrate of said second active region, wherein said source region being in said substrate of said second well around said polysilicon gate electrode, and said drain region being in said substrate of said first well around a lateral of said field oxide region which is not covered by said polysilicon gate electrode.

US 6,410,378 B2

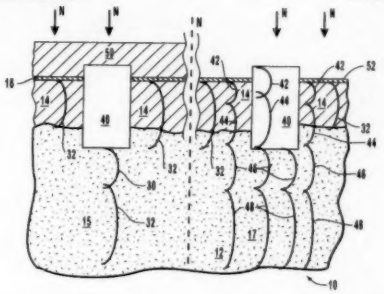
METHOD OF FABRICATION OF SEMICONDUCTOR STRUCTURES BY ION IMPLANTATION

Fernando Gonzalez, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Division of application No. 09/370,497, filed on Aug. 9, 1999, now Pat. No. 6,291,323, which is a continuation of application No. 08/897,364, filed on Jul. 22, 1997, now Pat. No. 5,937,287. This application Sep. 14, 2001, Appl. No. 953,388.

Int. Cl. H01L *21/8238*

U.S. Cl. 438—217 **14 Claims**



1. A method of doping a semiconductor device, comprising:

directing ions of a first type toward said semiconductor device;

directing ions of a second type toward said semiconductor device; and

protecting a portion of said semiconductor device from said ions of said second type; wherein:

said semiconductor device includes a mask layer over a nitride layer that is over an oxide layer, the oxide layer being over a semiconductor substrate having an active area therein;

directing ions of a first type toward said semiconductor device further comprises:

implanting said ions of said first type into the active area, said ions of said first type passing through both the nitride layer and the oxide layer;

removing the mask layer over the nitride layer; and

implanting said ions of said first type into the semiconductor substrate; and

directing ions of a second type toward said semiconductor device further comprises:

removing the nitride layer over the oxide layer;

implanting said ions of said second type into the semiconductor substrate, said ions of said second type passing through the oxide layer.

US 6,410,379 B2

METHOD OF FORMING A SUBMERGED SEMICONDUCTOR STRUCTURE

Sven E. Wahlstrom, 570 Jackson Dr., Palo Alto, Calif. 94303

Division of application No. 08/794,004, filed on Feb. 3, 1997, which is a division of application No. 08/609,401, filed on Mar. 1, 1996, now Pat. No. 5,796,671. This application May 24, 2001, Appl. No. 865,926.

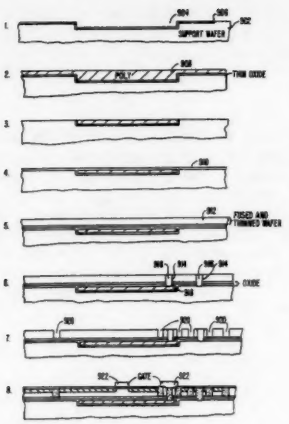
Int. Cl. H01L *21/8238*

U.S. Cl. 438—222 **15 Claims**

1. A method of forming a submerged horizontal semiconductor structure comprising the steps of:

forming a horizontal recessed area in a wafer of first conductivity type;

forming a dielectric layer on the surface of the recessed area;



depositing a polysilicon layer on top of the dielectric layer until the recessed area is substantially filled to form a polysilicon region;

selectively implanting a dopant of second conductivity type in a first defined region; and

growing an epitaxial layer over the wafer.

US 6,410,380 B2

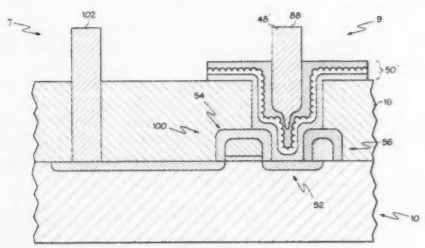
METHOD FOR MAKING SEMICONDUCTOR DEVICE INCORPORATING AND ELECTRICAL CONTACT TO AN INTERNAL CONDUCTIVE LAYER

Todd Edgar, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of application No. 09/565,900, filed on May 5, 2000, which is a division of application No. 09/317,703, filed on May 24, 1999, which is a division of application No. 08/881,737, filed on Jun. 24, 1997, now Pat. No. 5,970,340. This application Oct. 4, 2001, Appl. No. 971,242.

Int. Cl. H01L *21/8242*

U.S. Cl. 438—238 **8 Claims**



1. A method of fabricating a storage container structure comprising the steps of:

providing a substrate including a semiconductor structure;

forming a patterning stop region that includes a central stop region, a first lateral stop region, and a second lateral stop region;

forming an insulating overlayer over a first surface of said substrate;

patterning a container region within said insulating overlayer, wherein said container region defines a container cross section having a container bottom wall, a first side wall including a first upper side wall portion and a first lower side wall portion, and a second side wall including a second upper side wall portion and a second lower side wall portion, wherein

said first upper side wall portion and said second upper side wall portion define an upper container portion therebetween,

said first lower side wall portion and said second lower side wall portion define a lower container portion therebetween,

said upper container portion is wider than said lower container portion,

said container bottom wall is defined by said central stop region,

said first lower side wall portion is defined by a lateral surface of said first lateral stop region, and

said second lower side wall portion is defined by an opposite lateral surface of said second lateral stop region;

layering a charge storage lamina over an interior surface of said container region, said charge storage lamina comprising:

a first conductive film over an interior surface of said container region;

an intermediate insulating film over said first conductive film such that a backfill region occupying said upper and lower container portions and bounded by said intermediate insulating film is formed; and

a second conductive film over said intermediate insulating film, said second conductive film defining a downward-facing projection component such that said second conductive film occupies a substantial portion of said lower container portion, and a backfill component contiguous with and disposed above said downward-facing projection component such that the vertically-extending thickness of said backfill component is sufficient to occupy a substantial vertically-extending portion of said upper container portion, thereby possessing improved resistance to electrical shorting;

patterning a contact region in said backfill component of said second conductive film; and

forming an electrical contact in said contact region such that respective portions of said electrical contact and said charge storage lamina occupy collectively at least a portion of said container region.

US 6,410,381 B2

METHOD FOR FORMING CAPACITOR OF SEMICONDUCTOR DEVICE

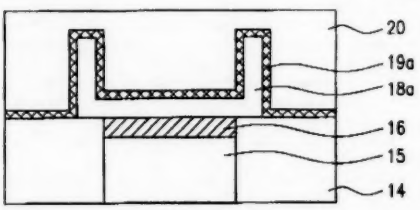
Kyong Min Kim, Kyoungki-do; Kyung Cheol Jeong, Chungcheongbuk-do; Han Sang Song, Seoul, and Dong Jun Kim, Kyoungki-do, all of Rep. of Korea, assignors to Hynix Semiconductor Inc., Kyoungki-do, Rep. of Korea

Filed May 31, 2001, Appl. No. 867,658

Claims priority, application Rep. of Korea, Jun. 1, 2000, 2000-30090

Int. Cl. H01L *21/8242*

U.S. Cl. 438—240 **19 Claims**



1. A method of forming a capacitor of a semiconductor device, comprising:

providing a semiconducotor substrate;

forming a lower electrode on the semiconductor substrate, said lower electrode comprising an Ru film formed in-situ, said in-situ forming comprising in sequential order a low pressure chemical vapor deposition (LPCVD) and a plasma enhanced chemical vapor deposition (PECVD);

forming an amorphous TaON film on the lower electrode;

crystallizing the amorphous TaON film, said crystallizing comprising a thermal treatment; and

forming an upper electrode on the crystallized TaON film.

US 6,410,382 B1

FABRICATION METHOD OF SEMICONDUCTOR DEVICE

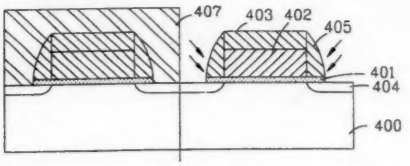
Ki Jae Huh, Jincheon, and Duk Hee Lee, Seoul, both of Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyoungki-Do, Rep. of Korea

Filed Nov. 5, 1999, Appl. No. 434,521

Claims priority, application Rep. of Korea, Apr. 19, 1999, 99-13786

Int. Cl. H01L *21/8242*

U.S. Cl. 438—241 **21 Claims**



1. A fabrication method of a semiconductor device, comprising:

forming a gate insulating film over a semiconductor substrate;

forming a gate electrode on the gate insulating film;

implanting low-density impurity ions into the semiconductor substrate at both sides of the gate electrode;

forming sidewall spacers on side surfaces of the gate electrode;

implanting nitrogen into at least one portion of the gate insulating film adjacent to the gate electrode, wherein the nitrogen implantation comprises,

implanting nitrogen ions only into the gate insulating film formed under the sidewall spacers; and

implanting high-density impurity ions into the semiconductor substrate using the gate electrode and the sidewall spacers as a mask, wherein the implanted high-density impurity ions form source/drain regions.

US 6,410,383 B1

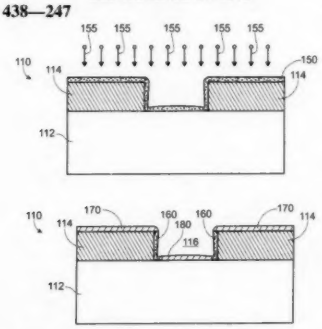
METHOD OF FORMING CONDUCTING DIFFUSION BARRIERS

Yanjun Ma, Vancouver, Wash., assignor to Sharp Laboratories of America, Inc., Camas, Wash.

Filed Mar. 16, 2000, Appl. No. 527,541

Int. Cl. H01L *21/8242*

U.S. Cl. 438—247 **20 Claims**



1. A method of forming a conducting barrier for integrated circuits comprising the steps of:

a) providing a semiconductor substrate;

b) depositing a layer of an initial material; and

c) implanting ions into the initial material to form an implanted material; and

d) annealing the implanted material to form a desired material.

US 6,410,384 B1

METHOD OF MAKING AN ELECTRIC CONDUCTIVE STRIP

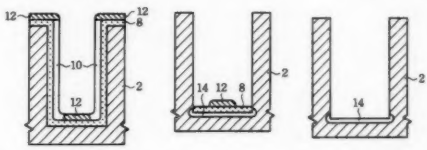
Horng-Huei Tseng, Hsinchu, Taiwan, assignor to Vanguard International Semiconductor Corporation, Hsinchu, Taiwan

Continuation-in-part of application No. 09/664,481, filed on Sep. 18, 2000. This application Feb. 26, 2001, Appl. No. 795,022.

This patent is subject to a terminal disclaimer.

Int. Cl. H01L *21/8242*

U.S. Cl. 438—249 **19 Claims**



1. A method for manufacturing a conductive strip for integrated circuits, said method comprising the steps of:

forming a trench into a substrate;

conformally forming a doped dielectric layer along a surface of said etched substrate;

conformably forming an ion-implanted-sensitive resist lying over said doped dielectric layer;

performing an anisotropical implantation to implant ions into a horizontal portion of said ion-implanted-sensitive resist, thereby generating horizontal insoluble portions and vertical soluble portions;

removing said vertical soluble portions to expose said doped dielectric layer attached on side walls of said trench;

removing said doped dielectric layer attached on said side walls of said trench;

removing said horizontal insoluble portions of said ion-implanted-sensitive resist;

removing said doped dielectric layer on an upper surface of said substrate; and

performing a thermal treatment to diffuse dopants in said doped dielectric layer into said substrate under said trench, thereby forming a conductive region.

US 6,410,385 B2

ROM-EMBEDDED-DRAM

Casey R. Kurth, Eagle; Scott J. Derner, Meridian, and Patrick J. Mullarkey, Meridian, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Division of application No. 09/559,832, filed on Apr. 28, 2000, now Pat. No. 6,243,285, which is a division of application No. 09/127,042, filed on Jul. 31, 1998, now Pat. No. 6,134,137. This application Apr. 13, 2001, Appl. No. 833,706.

Int. Cl. H01L *21/8242;21/44*

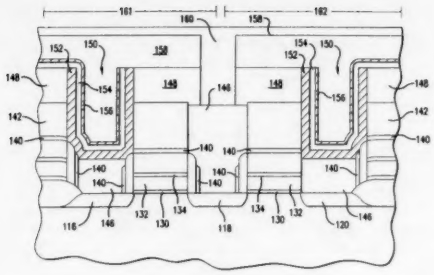
U.S. Cl. 438—253 **16 Claims**

10. A method of forming a ROM-embedded-DRAM memory circuit comprising the steps of:

providing an array of substantially electrically isolated word lines atop a semiconductor wafer;

providing active areas about the word lines to define an array of memory cell field effect transistors, the active areas being defined by a first and second active region for electrical connection with a memory cell capacitor and a third active region for electrical connection with a bit line;

providing a first layer of electrically insulating material over the word lines and active regions, the layer of insulating material having an uppermost surface which is above the word lines;



providing first and second respective contact openings through the first insulating material layer to the active regions, at least one of said openings removing at least a portion of insulating material from at least one of said wordlines;

providing a first layer of electrically conductive material over the first insulating material and within the contact openings, wherein said conductive material is in electrical contact with said at least one of said wordlines.

US 6,410,386 B1

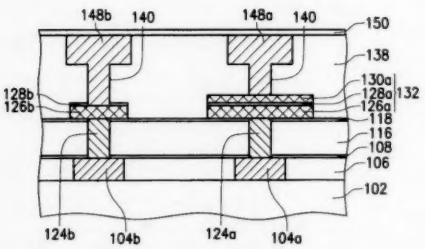
METHOD FOR FORMING A METAL CAPACITOR IN A DAMASCENE PROCESS

Chen-Chiu Hsue, Hsinchu; Shyh-Dar Lee, Hsinchu Hsien, and Jen-Hann Tsai, Tianan, all of Taiwan, assignors to Silicon Integrated Systems Corp., Taiwan

Filed Jun. 15, 2001, Appl. No. 881,102

Int. Cl. H01L *21/8242*

U.S. Cl. 438—253 **10 Claims**



1. A method for forming a metal capacitor in a damascene process, comprising:

providing a first insulator;

forming a first Cu wire and a second Cu wire in the first insulator by executing a damascene process;

forming a first sealing layer at least on the first and the second Cu wires;

forming a second insulator on the first sealing layer;

forming a third insulator acting as an etch stop layer on the second insulator;

forming a first Cu plug and a second Cu plug in the first sealing layer, the second insulator and the third insulator;

forming a first metal layer on the third insulator and the first and second Cu plugs;

forming a fourth insulator on the first metal layer;

forming a second metal layer on the fourth insulator;

patterning the second metal layer, the fourth insulator and the first metal layer to form a capacitor and a conducting wire with a remaining fourth insulator and a remaining second metal layer thereon, wherein a lower electrode of the capacitor is connected with the first Cu wire through the first Cu plug and the conducting wire is connected with the second Cu wire through the second Cu plug;

removing the remaining second metal layer;

forming a fifth insulator with a flat surface on the upper electrode, the fourth insulator and the third insulator;

forming dual damascene structures including a third plug, a fourth Cu plug, a third Cu wire and a fourth Cu wire in the fifth insulator, wherein an upper electrode of the capacitor is connected with the third Cu wire through the third Cu plug, and the conducting wire is connected with the fourth Cu wire through the fourth Cu plug; and

forming a second sealing layer covering at least the third and fourth Cu wires.

US 6,410,387 B1

PROCESS FOR INTEGRATING IN A SAME CHIP A NON-VOLATILE MEMORY AND A HIGH-PERFORMANCE LOGIC CIRCUITRY

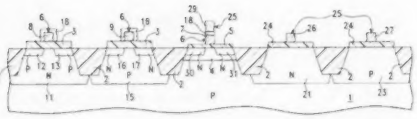
Paolo Giuseppe Cappelletti, Seveso, and Alfonso Maurelli, Sulbiate, both of Italy, assignors to STMicroelectronics, S.r.l., Agrate Brianza, Italy

Filed Nov. 24, 1999, Appl. No. 449,044

Claims priority, application European Pat. Off., Nov. 26, 1998, 98830709

Int. Cl. H01L *21/336;21/8234;21/8238;21/469*

U.S. Cl. 438—257 **24 Claims**



1. A process for the manufacturing of an integrated circuit including a low operating voltage, high-performance logic circuitry and an embedded memory device having a high operating voltage higher than said low operating voltage of the logic circuitry, the process comprising:

on first portions of a semiconductor substrate, forming a first gate oxide layer with a first thickness for first transistors operating at said high operating voltage;

on second portions of the semiconductor substrate, forming a second gate oxide layer with a second thickness for memory cells of the memory device;

on said first and second gate oxide layers, forming from a first polysilicon layer gate electrodes for the first transistors, and floating-gate electrodes for the memory cells;

in said first portions of the semiconductor substrate, forming source and drain regions for the first transistors;

after forming source and drain regions in the first portion, forming over the floating-gate electrodes of the memory cells a dielectric layer;

on third portions of the semiconductor substrate, forming a third gate oxide layer with a third thickness for second transistors operating at said low operating voltage;

on the dielectric layer and on said third portions of the semiconductor substrate, forming from a second polysilicon layer control gate electrodes for the memory cells, and gate electrodes for the second transistors;

in said second portions of the semiconductor substrate, forming source and drain regions for the memory cells; and

in said third portions of the semiconductor substrate, forming source and drain regions for the second transistors.

US 6,410,388 B1

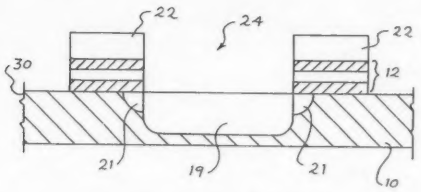
PROCESS FOR OPTIMIZING POCKET IMPLANT PROFILE BY RTA IMPLANT ANNEALING FOR A NON-VOLATILE SEMICONDUCTOR DEVICE

George Jonathan Kluth, Sunnyvale, Calif.; Stephen K. Park, Austin, Tex.; Arvind Halliyal, Sunnyvale, and David K. Foote, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Provisional application No. 60/182,612, filed on Feb. 15, 2000. This application Jul. 20, 2000, Appl. No. 620,480.

Int. Cl. H01L *21/336*

U.S. Cl. 438—257 **18 Claims**



1. A process for fabricating a non-volatile semiconductor device comprising:

providing a substrate having a principal surface;

forming an ONO layer overlying the principal surface;

implanting boron into the substrate at an implant angle substantially normal to the principal surface;

annealing the substrate at a temperature from about 900° C. to about 1050° C. to laterally diffuse the boron and form a boron pocket region in the substrate having a first junction depth; and

implanting an n-type dopant to form a n-type region in the substrate to a second junction depth, wherein the second junction depth is less than the first junction depth.

US 6,410,389 B1

NON-VOLATILE MEMORY CELL WITH A SINGLE LEVEL OF POLYSILICON, IN PARTICULAR OF THE FLASH EEPROM TYPE, AND METHOD FOR MANUFACTURING THE SAME

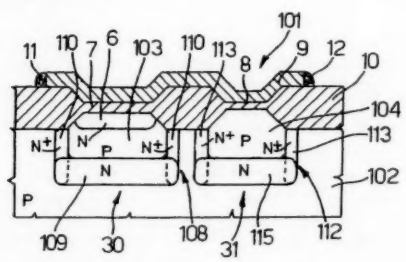
Paolo Cappelletti, Seveso; Alfonso Maurelli, Sulbiate, and Nicola Zatelli, Bergamo, all of Italy, assignors to STMicroelectronics S.r.l., Agrate Brianza, Italy

Filed Oct. 6, 2000, Appl. No. 684,721

Claims priority, application European Pat. Off., Oct. 7, 1999, 99830629

Int. Cl. H01L *21/336*

U.S. Cl. 438—257 **21 Claims**



1. A non-volatile memory cell with a single level of polysilicon, comprising:

a substrate of semiconductor material, which has a first type of conductivity;

a control gate region, with a second type of conductivity, formed in said substrate, in a first active region;

source and drain regions with the second type of conductivity, formed in said substrate, in a second active region, adjacent to said first active region;

a floating gate region extending above said substrate, transversely relative to said first and second active regions; and

wherein said control gate region is produced in a first triple-well structure.

US 6,410,390 B1

NONVOLATILE MEMORY DEVICE AND METHOD FOR FABRICATING THE SAME

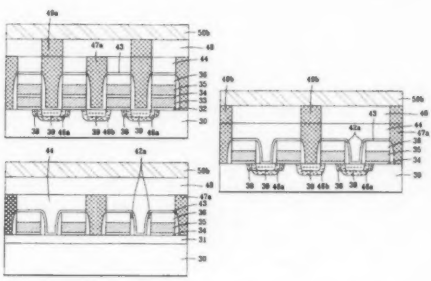
Jae Seung Choi, and Sang Bae Yi, both of Seoul, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyoungki Do, Rep. of Korea

Filed Nov. 14, 2000, Appl. No. 710,954

Claims priority, application Rep. of Korea, Feb. 3, 2000, 00-5379

Int. Cl. H01L *21/336*

U.S. Cl. 438—257 **24 Claims**



1. A method for fabricating a nonvolatile memory device comprising the steps of:

defining first and second active regions to be arranged on a semiconductor substrate in one direction;

depositing a first gate insulating layer and a floating gate on the first and second active regions in a pattern, and depositing a second gate insulating layer and a control gate line in one direction perpendicular to the first and second active regions to cover the floating gate;

forming first impurity regions in the first and second active regions at one side of the control gate line;

forming second impurity regions in the first and second active regions at other side of the control gate line;

forming a buffer insulating layer on the entire surface of the semiconductor substrate including the first and second impurity regions;

forming a first interlayer dielectric on the semiconductor substrate such that first contact holes are provided in the first impurity regions and that a line-type contact hole is formed by connecting and exposing the second impurity regions of the first and second active regions;

forming a third impurity region by injecting ions into the first and second impurity regions exposed by the first contact holes and the line-type contact hole;

removing the buffer insulating layer from the first contact holes and the line-type contact hole; and

forming first contact plugs in the first contact holes and forming a common conductive line in the line-type contact hole.

US 6,410,391 B1
METHOD FOR PRODUCING AN EEPROM MEMORY CELL WITH A TRENCH CAPACITOR

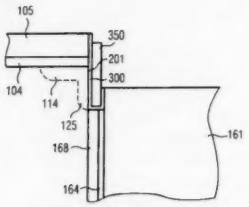
Rudolf Zelsacher, Klagenfurt, Austria, assignor to Infineon Technologies AG, Munich, Germany

Filed Jun. 30, 2000, Appl. No. 607,317

Claims priority, application Germany, Jul. 2, 1999, 199 30 748

Int. Cl. H01L *21/336*

U.S. Cl. 438—259 **10 Claims**



1. A method for fabricating an EEPROM memory cell having a trench capacitor, which comprises:

providing a substrate having a weakly doped epitaxial layer and a more heavily doped layer disposed under the weakly doped epitaxial layer;

forming a trench in the substrate, the trench having a lower region and an upper region, the lower region at least partially in the weakly doped epitaxial layer;

filling the lower region of the trench with a first filling material;

forming an insulation collar in the upper region of the trench;

removing the first filling material from the lower region of the trench;

forming a buried plate as a first capacitor plate in the lower region of the trench in the weakly doped epitaxial layer;

filling the trench with a conductive second filling material to form a second capacitor plate;

providing a capacitor dielectric between the conductive second filling material and the buried plate;

forming a dielectric tunnel layer in the trench at an interface of a buried contact and an associated selection transistor; and

forming a conductive protective layer on the dielectric tunnel layer.

US 6,410,392 B1
METHOD OF PRODUCING MOS TRANSISTOR

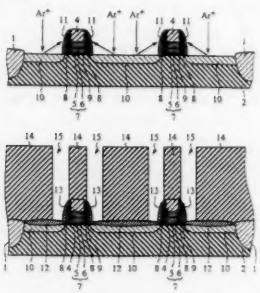
Yasunori Sogo, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 2001, Appl. No. 874,111

Claims priority, application Japan, Jan. 29, 2001, 2001-020518

Int. Cl. H01L *21/336;21/3205;21/4763*

U.S. Cl. 438—279 **4 Claims**



1. A method of producing MOS transistor comprising the steps of:

forming a gate electrode on a gate oxide film formed on a silicon substrate,

forming a side wall spacer on a side wall of said gate electrode after the formation of said gate electrode,

forming a diffusion layer in a surface layer of said silicon substrate after the formation of said side wall spacer,

forming a silicon film on said side wall spacer after the formation of said diffusion layer,

building up a metal film after the formation of said silicon film and performing a heat treatment to form a metal silicide layer on said diffusion layer and said side wall spacer, and

forming an inter-layer insulation film after the formation of said metal silicide layer and providing said inter-layer insulation film with a contact hole overlapping said side wall spacer.

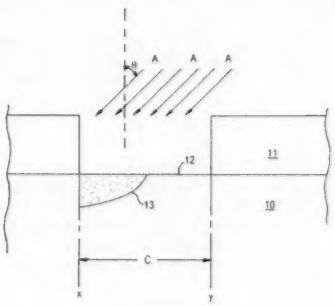
US 6,410,393 B1
SEMICONDUCTOR DEVICE WITH ASYMMETRIC CHANNEL DOPANT PROFILE

Ming-Yin Hao, and Emi Ishida, both of Sunnyvale, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Provisional application No. 60/149,422, filed on Aug. 18, 1999. This application Aug. 17, 2000, Appl. No. 639,797.

Int. Cl. H01L *21/336*

U.S. Cl. 438—286 **9 Claims**



1. A method of manufacturing a semiconductor device containing a metal-oxide-silicon (MOS) transistor, the method comprising the sequential steps of:

(a) providing a substrate containing an impurity of a first conductivity type;

(b) forming a mask on the main surface of the substrate exposing a region in which a designated channel region of a second conductivity type, opposite the first conductivity type, MOS transistor will be formed, the channel region having a first end proximate one source/drain region and a second end proximate the other source/drain region;

(c) ion implanting an impurity at an angle to form an amorphous region, in the designated channel region with a varying degree of amorphization decreasing from the first end toward the second end;

(d) ion implanting an impurity of the first conductivity type into the designated channel region to form a channel implant overlapping the amorphous region; and

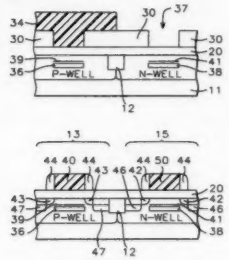
(e) annealing to diffuse the channel implant forming a first conductivity type impurity concentration gradient across the channel region having a higher impurity concentration at the second end than at the first end.

US 6,410,394 B1

METHOD FOR FORMING SELF-ALIGNED CHANNEL IMPLANTS USING A GATE POLY REVERSE MASK

Kai Shao; Yimin Wang; Jian Xun Li, and Shao-Fu Sanford Chu, all of Singapore, Singapore, assignors to Chartered Semiconductor Manufacturing Ltd., Singapore, Singapore

Filed Dec. 17, 1999, Appl. No. 465,305
Int. Cl. H01L *21/336*
U.S. Cl. 438—289 **8 Claims**



1. A method for forming a transistor gate with a self-aligned channel implant, comprising the sequential steps of:

a. providing a semiconductor structure having a first active area;

b. forming a first insulating layer on said semiconductor structure, and forming a second insulating layer on said first insulating layer;

c. patterning said second insulating layer using a poly reverse mask and an etch selective to said first insulating layer to form a first channel implant opening over said first active area;

d. removing said poly reverse mask, and forming a first channel implant mask on a second active area, whereby said first channel implant opening is exposed;

e. implanting impurity ions through said first channel implant opening to form a first threshold voltage adjust region and implanting impurity ions through said first channel implant opening to form a first anti-punchthrough region;

f. depositing a gate layer over said semiconductor structure and said second insulating layer, and planarizing said gate layer using a chemical mechanical planarization process to form a first gate electrode; and

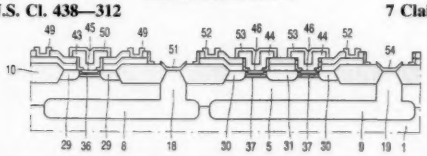
g. removing said second insulating layer, thereby exposing sidewalls of the first gate electrode.

US 6,410,395 B1

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE COMPRISING SIGE HBTS

Doede Terpstra; Jan Willem Slotboom; Youri Ponomarev; Petrus Hubertus Cornelis Magnee, all of Eindhoven, and Freerk Van Rijs, Nijmegen, all of Netherlands, assignors to Koninklijke Philips Electronics N.V., Eindhoven, Netherlands

Filed Nov. 16, 2000, Appl. No. 713,865
Claims priority, application European Pat. Off., Nov. 18, 1999, 99203850
Int. Cl. H01L *21/331*
U.S. Cl. 438—312 **7 Claims**



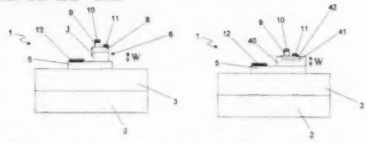
1. A method of manufacturing a semiconductor device comprising bipolar transistors, in which method, in succession, a first semiconductor layer of monocrystalline silicon, a second semiconductor layer of monocrystalline silicon with 5 to 25 at. % germanium and a third semiconductor layer of monocrystalline silicon are provided on a surface of a silicon wafer by means of epitaxial deposition, base zones of the transistors being formed in the second semiconductor layer of monocrystalline silicon with germanium, characterized in that the second semiconductor layer of monocrystalline silicon with 5 to 25 at. % germanium is deposited without a base doping, and this base doping is introduced into this second layer at a later stage.

US 6,410,396 B1

SILICON CARBIDE: GERMANIUM (SIC:GE) HETEROJUNCTION BIPOLAR TRANSISTOR; A NEW SEMICONDUCTOR TRANSISTOR FOR HIGH-SPEED, HIGH-POWER APPLICATIONS

Jeffrey B. Casady; Michael S. Mazzola, and Stephen E. Saddow, all of Starkville, Miss., assignors to Mississippi State University, Mississippi State, Miss.

Provisional application No. 60/199,822, filed on Apr. 26, 2000. This application Apr. 4, 2001, Appl. No. 825,065.
Int. Cl. H01L *21/331*
U.S. Cl. 438—312 **27 Claims**



17. A method for making integrated circuits having at least one heterojunction bipolar transistor, comprising:

forming a degeneratively doped n-type subcollector layer on a substrate;

forming a doped n-type collector layer on the subcollector layer, wherein the collector layer has less doping than the subcollector layer, wherein the collector layer has a surface;

forming a degeneratively doped p-type base layer on the surface of the collector layer, the base layer having a surface; and

forming a doped n-type emitter layer on the surface of the base layer, the emitter layer having greater doping than the collector layer;

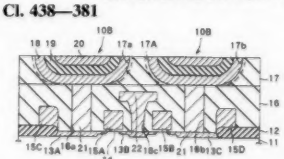
wherein a pseudoalloying material is introduced at varying concentrations in the base layer and in the collector layer, the concentration varying from a greater concentration in the base layer to a lesser concentration in the collector layer, such that a graded junction is formed.

US 6,410,397 B1

METHOD FOR MANUFACTURING A DIELECTRIC TRENCH CAPACITOR WITH A STACKED-LAYER STRUCTURE

Akihiko Ochiai, and Masahiro Tanaka, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of application No. 09/244,201, filed on Feb. 4, 1999, now Pat. No. 6,215,646. This application Oct. 2, 2000, Appl. No. 677,260.
Claims priority, application Japan, Feb. 6, 1998, P10-026092
Int. Cl. H01L *21/70;21/44*
U.S. Cl. 438—381 **10 Claims**



1. A method of manufacturing a dielectric capacitor including steps of:

forming a second interlevel insulator with a surface being flattened on a substrate in which a transistor covered with a first

interlevel insulator is formed, and forming a trench in the second interlevel insulator contacting the transistor;

flattening a surface of the trench in alignment with the surface of the second interlevel insulator after stacking a first electrode layer, a dielectric film, and a second electrode layer in the trench of the second interlevel insulator in this order.

US 6,410,398 B1

DEVICE FOR THE ADJUSTMENT OF CIRCUITS AFTER PACKAGING, CORRESPONDING FABRICATION PROCESS AND INDUCTION DEVICE

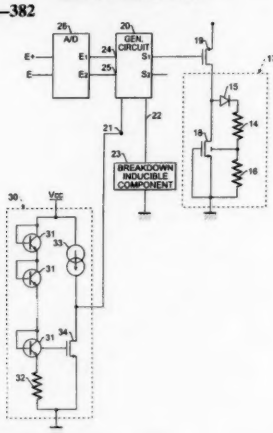
Christophe Forel, Annonay; Sebastien Laville, Grenoble, and Serge Pontarollo, St. Martin le Vinoux, all of France, assignors to STMicroelectronics S.A., Gentilly, France

Filed Jun. 28, 2000, Appl. No. 604,989

Claims priority, application France, Jun. 28, 1999, 99 08240

Int. Cl. H01L *21/20*

U.S. Cl. 438—382 **21 Claims**



1. An integrated circuit comprising:

a substrate;

a MOS transistor comprising a source, a drain, and a gate on said substrate, said MOS transistor defining a parasitic bipolar transistor with said substrate;

a first resistor connected between said substrate and said source;

a second resistor connected between said substrate and said drain; and

a diode connected in series with said second resistor between said substrate and said drain;

said gate and said source being connected together so that application of a voltage between said drain and said source biases a base/emitter junction of the parasitic bipolar transistor and a prebiasing voltage is applied to said substrate for breaking down said MOS transistor.

US 6,410,399 B1

PROCESS TO LOWER STRAP, WORDLINE AND BITLINE CONTACT RESISTANCE IN TRENCH-BASED DRAMS BY SILICIDIZATION

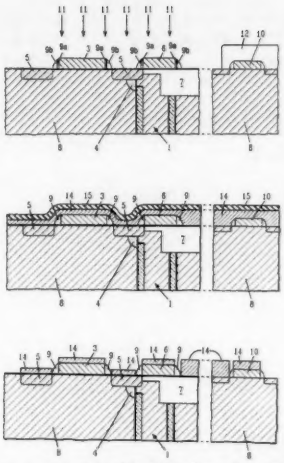
Philip Lee Flaitz, Newburgh; Herbert L. Ho, Cornwall; Subramanian Iyer, Mount Kisco; Babar Khan, Ossining, and Paul C. Parries, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 2000, Appl. No. 606,493

Int. Cl. H01L *21/20;21/8242*

U.S. Cl. 438—387 **17 Claims**

1. A method of silicidizing an array region in a memory device to lower electrical resistance of said array region, comprising the steps of:



a) applying a resist and a block-level mask to lithographically define an array region of a memory device, said array region includes, at least one wordline having junction regions abutting said at least one wordline, said junction regions are formed in a surface of a substrate;

b) doping said array region of said memory device using a dual implant process so as to form a graded junction in said substrate;

c) removing said resist;

d) annealing said array region;

e) etching said array region of said memory device so as to remove any native oxides from surfaces of said array region;

f) depositing a layer of conductive metal on said array region;

g) forming a capping layer on said conductive metal layer;

h) rapidly annealing said array region at a temperature less than about 600° C. so as to form a metal silicide over at least said one wordline and said graded junction;

i) removing said capping layer and any residual conductive metal from said array region;

j) rapidly annealing said array region at a temperature of about 700° C. or above; and

k) depositing an oxide layer on said array region.

US 6,410,400 B1

METHOD OF MANUFACTURING TA_2O_5CAPACITOR USING TA_2O_5THIN FILM AS DIELECTRIC LAYER

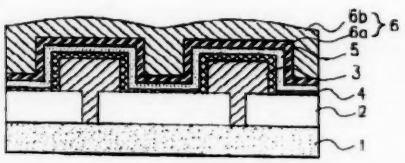
Kee Jeung Lee, Seoul, and Kwang Chul Joo, Kyoungki-do, both of Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Filed Nov. 9, 2000, Appl. No. 708,455

Claims priority, application Rep. of Korea, Nov. 9, 1999, 99-49503

Int. Cl. H01L *21/20*

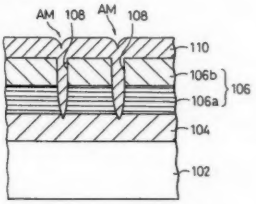
U.S. Cl. 438—396 **4 Claims**



1. A method of manufacturing a capacitor of a semiconductor device comprising the steps of:

preparing a semiconductor substrate incorporating lower patterns;
covering the semiconductor substrate with an intermediate insulating layer;
forming a lower electrode on the intermediate insulating layer;
nitrifying the surface of the lower electrode;
depositing a amorphous Ta_2O_5 thin film on the nitrified surface of the lower electrode;
annealing the amorphous Ta_2O_5 thin film at a first temperature;
further annealing the Ta_2O_5 thin film at a second temperature, the second temperature being both higher than the first temperature and sufficiently high to form a crystalline Ta_2O_5 thin film dielectric layer; and
forming an upper electrode on the crystalline Ta_2O_5 thin film dielectric layer;
wherein the lower electrode is a conductive layer comprising one conductor selected from a group consisting of TiN, TaN, W, WSi, Ru, RuO_2, Ir, IrO_2, and Pt.

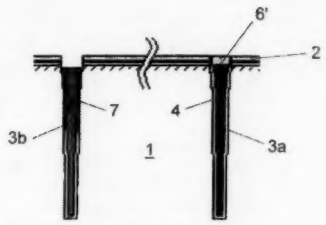
US 6,410,401 B1
FORMATION OF AN ALIGNMENT MARK IN THE SURFACE OF AN ALUMINUM LAYER
Shiro Ohtaka, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Continuation of application No. 09/228,576, filed on Jan. 12, 1999, now Pat. No. 6,100,157, which is a division of application No. 09/100,876, filed on Jun. 22, 1998, now Pat. No. 6,037,670. This application Jul. 26, 2000, Appl. No. 626,799. Claims priority, application Japan, Jun. 27, 1997, 9-187550
This patent is subject to a terminal disclaimer.
Int. Cl. H01L *21/76*
U.S. Cl. 438—401 **4 Claims**



1. A method for forming an alignment mark as used in a process of manufacturing a silicon semiconductor device, comprising:
forming a first oxide film directly on a surface of a silicon substrate;
forming a lower aluminum layer directly on said first oxide film;
forming a second oxide film directly on said lower aluminum layer;
forming a base recess by etching said second oxide film in part at a predetermined position thereon; and
forming an upper aluminum layer over said second oxide film to fill up said base recess therewith,
thereby forming a mark as an alignment mark on a surface of said upper aluminum layer, at a position in correspondence with a position of a reference mark.

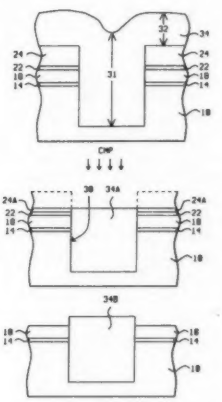
US 6,410,402 B1
METHOD OF PROVIDING VARIANT FILLS IN SEMICONDUCTOR TRENCHES
Jay Harrington, Wappingers Falls, and Liang-Kai Han, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 5, 2000, Appl. No. 680,380
Int. Cl. H01L *21/76*
U.S. Cl. 438—424 **13 Claims**

1. A method of providing variant fills in a semiconductor substrate having a plurality of trenches, said method comprising:



providing a semiconductor substrate with a first set of trenches and a second set of trenches;
filling all said trenches with a first fill material;
masking said second set of trenches in a manner effective in resisting an etching of said first fill material;
etching said first fill material in said first set of trenches to a depth effective in permitting said first set of trenches to be plugged, thereby defining a plug cavity in each of said first set of trenches;
plugging said plug cavities with a plugging material resistant to an etching of said first fill material;
etching said first fill material from said second set of trenches; and
filling said second set of trenches with a second fill material.

US 6,410,403 B1
METHOD FOR PLANARIZING A SHALLOW TRENCH ISOLATION
Chao-Chueh Wu, Hsin-Chu, Taiwan, assignor to ProMos Technologies, Inc., Hsin-Chu, Taiwan
Filed Nov. 2, 2000, Appl. No. 703,831
Int. Cl. H01L *21/8242;21/302;21/461;21/311*
U.S. Cl. 438—424 **11 Claims**



1. A method of planarizing an isolation region; comprising the steps of:
a) forming a pad oxide layer, a first nitride layer, a sacrificial oxide layer and a second nitride layer over a substrate;
b) forming a trench through said pad oxide layer, said first nitride layer, said sacrificial oxide layer and said second nitride layer and in said substrate;
c) depositing an oxide layer filling said trench and over said second nitride layer;
d) chemical-mechanical polishing said oxide layer and said second nitride layer down to a level so that said second nitride layer has a thickness of between about 50 and 200 Å;
e) removing said second nitride layer and said sacrificial oxide layer and a thickness of said oxide layer;

f) chemical-mechanical polishing said oxide layer and said first nitride layer so that the top surface of said oxide layer is about level within 10 percent, with the top surface of said first nitride layer.

US 6,410,404 B1

PROCESS FOR MANUFACTURING SOI INTEGRATED CIRCUITS AND CIRCUITS MADE THEREBY

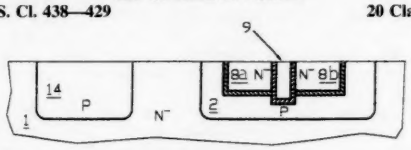
Raffaele Zambrano, Viagrande, Italy, assignor to STMicroelectronics S.r.l., Agrate Brianza, Italy

Filed Apr. 28, 2000, Appl. No. 561,272

Claims priority, application European Pat. Off., Apr. 30, 1999, 99830262

Int. Cl. H01L *21/76;21/44*

U.S. Cl. 438—429 **20 Claims**



1. A process for manufacturing SOI circuit structures integrated on a semiconductor substrate having a first conductivity type, said strucoas being able to accommodate electronic devices in a substrate portion, the process comprising:

forming a first well with a second conductivity type in said semiconductor substrate;

forming a hole in said first well the hole having a first surface;

coating said hole with an insulating coating layer;

forming an opening through said insulating coating layer at the first surface of the hole;

filling the hole with an epitaxial layer grown from a seed made accessible through said opening; and

forming a second well between said epitaxial layer and said insulating coating layer which has the same type of conductivity as the semiconductor substrate.

US 6,410,405 B2

METHOD FOR FORMING A FIELD OXIDE FILM ON A SEMICONDUCTOR DEVICE INCLUDING MASK SPACER AND ROUNDING EDGE

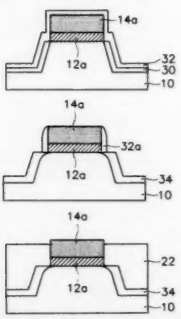
Myoung Kyu Park, Choongcheongbuk-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Filed Jul. 2, 2001, Appl. No. 895,411

Claims priority, application Rep. of Korea, Jun. 30, 2000, 2000-36943

Int. Cl. H01L *21/336;21/76*

U.S. Cl. 438—431 **17 Claims**



1. A method for forming a field oxide film on a semiconductor device comprising the steps of:

producing a thermal oxidation mask on a silicon substrate;

producing a channel on said silicon substrate using said thermal oxidation mask;

producing a silicon epitaxial layer on the surface of said silicon substrate channel;

producing a spacer mask on side surfaces of said thermal oxidation mask;

producing a smooth edged silicon epitaxial layer near the interface between said spacer mask and said silicon epitaxial layer; and

producing a field oxide film on said silicon substrate.

US 6,410,406 B1

SEMICONDUCTOR DEVICE INCLUDING EDGE BOND PADS AND METHODS

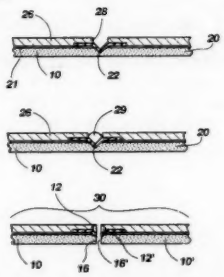
Warren M. Farnworth, Nampa; Larry D. Kinsman, Boise, and Walter L. Moden, Meridian, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of application No. 09/001,404, filed on Dec. 31, 1997, now Pat. No. 6,235,551. This application Sep. 13, 2000, Appl. No. 660,782.

This patent is subject to a terminal disclaimer.

Int. Cl. H01L *21/46;21/44*

U.S. Cl. 438—462 **17 Claims**



1. A method for fabricating a semiconductor device configured to be assembled with a carrier substrate in nonparallel relation thereto, comprising:

forming a plurality of disconnected notches in an active surface of a semiconductor wafer;

fabricating circuit traces to extend into selected notches of said plurality of disconnected notches;

fabricating a contact pad in each of said selected notches, said contact pad communicating with a corresponding circuit trace; and

singulating said semiconductor wafer along at least one notch of said plurality of disconnected notches.

US 6,410,407 B1

PRODUCT INCLUDING A SILICON-CONTAINING FUNCTIONAL LAYER AND AN INSULATING LAYER MADE OF SILICON DIOXIDE, AND METHOD FABRICATING THE PRODUCT

Stephan Pindl, Petershausen, and Markus Biebl, Augsburg, both of Germany, assignors to Infineon Technologies AG, Munich, Germany

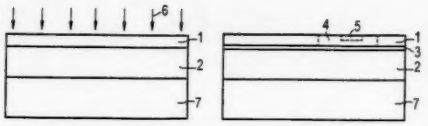
Continuation of application No. PCT/DE98/02181, filed on Jul. 30, 1998. This application Mar. 30, 2000, Appl. No. 539,235.

Claims priority, application Germany, Sep. 30, 1997, 197 43 297

Int. Cl. H01L *21/20;21/36*

U.S. Cl. 438—480 **5 Claims**

1. A method for fabricating a product including a silicon-containing functional layer, an insulating layer made of silicon dioxide, and a stop layer made of silicon nitride, the stop layer being disposed between the functional layer and the insulating



layer and connecting the functional layer to the insulating layer, the method which comprises:

providing a blank part including a functional layer and an insulating layer, the functional layer being disposed directly on the insulating layer and being bonded to the insulating layer;

implanting nitrogen with a given dose into the insulating layer; and

heat treating the blank part after the implanting step for causing a diffusion of the nitrogen to the functional layer and a bonding of the nitrogen to silicon of the functional layer for forming a stop layer with a thickness of between 2 nm and 4 nm, the thickness of the stop layer being a function of the given dose.

US 6,410,408 B1

CVD FILM FORMATION METHOD

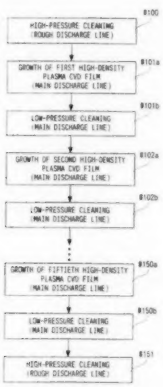
Hisashi Yano, Takaoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 30, 2001, Appl. No. 941,868

Claims priority, application Japan, Aug. 31, 2000, 2000-261987; Aug. 20, 2001, 2001-248447

Int. Cl. H01L *21/20;21/302*

U.S. Cl. 438—484 **9 Claims**


HIGH-PRESSURE CLEANING (ROUGH DISCHARGE LINE)
GROWTH OF FIRST HIGH-DENSITY PLASMA CVD FILM (MAIN DISCHARGE LINE)
LOW-PRESSURE CLEANING (MAIN DISCHARGE LINE)
GROWTH OF SECOND HIGH-DENSITY PLASMA CVD FILM (MAIN DISCHARGE LINE)
LOW-PRESSURE CLEANING (MAIN DISCHARGE LINE)
GROWTH OF FIFTIETH HIGH-DENSITY PLASMA CVD FILM (MAIN DISCHARGE LINE)
LOW-PRESSURE CLEANING (MAIN DISCHARGE LINE)
HIGH-PRESSURE CLEANING (ROUGH DISCHARGE LINE)

1. A CVD film formation method for forming a CVD film on a plurality of semiconductor substrates by using a CVD device that comprises a reaction chamber for forming a CVD film, a first exhaust line which is connected to the reaction chamber and does not include a turbo pump, and a second exhaust line which is connected to the reaction chamber separately from the first exhaust line and which includes a turbo pump, the method comprising:

a first process, which is repeated a number of times that corresponds to a predetermined number of substrates, and which comprises: a step of introducing a semiconductor substrate into the reaction chamber to form a CVD film thereon, and removing the semiconductor substrate, whose film formation is completed, from the chamber, in a state in which, while reactive gas is being supplied to the reaction chamber, the turbo pump is driven to exhaust the reactive gas via the second exhaust line such that the chamber is held at a predetermined internal reaction pressure; and a step of performing low-pressure cleaning of the reaction chamber, from which the semiconductor substrate has been removed, by, while supplying cleaning gas to the reaction chamber, discharging the gas via the second exhaust line such that the chamber is held at a predetermined low internal pressure that is higher than the pressure during the film formation; and

a second process in which high-pressure cleaning of the inside of the reaction chamber is performed by, while supplying cleaning gas to the reaction chamber, discharging the gas via the first exhaust line such that the chamber is held at a predetermined high internal pressure that is higher than the pressure during the film formation.

US 6,410,409 B1

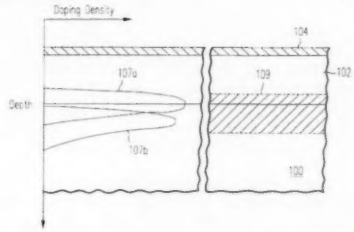
IMPLANTED BARRIER LAYER FOR RETARDING UPWARD DIFFUSION OF SUBSTRATE DOPANT

Mark I. Gardner, Cedar Creek; Robert Dawson, Austin; H. Jim Fulford, Jr., Austin; Frederick N. Hause, Austin; Mark W. Michael, Cedar Park; Bradley T. Moore, and Derick J. Wristers, both of Austin, all of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 31, 1996, Appl. No. 741,799

Int. Cl. H01L *21/265*

U.S. Cl. 438—526 **37 Claims**



1. In a semiconductor process, a method of retarding upward diffusion of a dopant within a semiconductor body, said method comprising the steps of:

providing a semiconductor body having a top surface and a heavily-doped layer beneath and separated from the top surface, said heavily-doped layer including a first dopant;

forming a transistor gate electrode over the semiconductor body;

forming a transistor source/drain region within the semiconductor body; and

implanting a material through a top portion of the semiconductor body to form a barrier layer of said material beneath and separated from the top surface and at a greater depth than the source/drain region, for retarding the upward diffusion of said first dopant.

US 6,410,410 B1

METHOD OF FORMING LIGHTLY DOPED REGIONS IN A SEMICONDUCTOR DEVICE

Thomas Feudel, Radebeul; Manfred Horstmann, Dresden, and Karsten Wieczorek, Boxdorf, all of Germany, assignors to Advanced Micro Devices, Inc., Austin, Tex.

Filed May 10, 2001, Appl. No. 852,535

Claims priority, application Germany, Nov. 23, 2000, 100 58 031

Int. Cl. H01L *21/225*

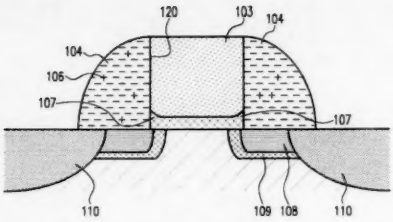
U.S. Cl. 438—547 **11 Claims**

1. A method of forming a lightly doped region in a semiconductor device comprising:

providing a substrate comprising a semiconductor region in an upper portion thereof;

forming a first dielectric layer of the substrate, the first dielectric layer comprising dopant atoms of a first type having a first concentration and a first diffusion length with respect to the material of the semiconductor region;

forming a second dielectric layer over the first dielectric layer, the second dielectric layer comprising dopant atoms of a



second type and a second concentration and a second diffusion length with respect to the material of the semiconductor region, and

applying a predefined temperature for a predefined time period to the substrate to allow dopant atoms of the first and second type to enter the semiconductor region to create a lightly doped region in the semiconductor region with a shape and a local dopant concentration that depend on the predefined temperature, the predefined time period, the first and second concentrations, and first and second diffusion length.

US 6,410,411 B1

ELECTRONIC DEVICE AND THEIR MANUFACTURE

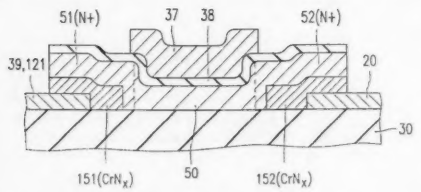
Brian P. McGarvey, Ballinasloe, Ireland; Steven C. Deane, Redhill, United Kingdom; Ian D. French, Hove, United Kingdom, and Michael J. Trainor, Horley, United Kingdom, assignors to Koninklijke Philips Electronics N.V., Netherlands

Division of application No. 08/933,593, filed on Sep. 19, 1997, now Pat. No. 6,087,730. This application May 23, 2000, Appl. No. 575,972.

Claims priority, application United Kingdom, Sep. 21, 1996, 9619808; Nov. 7, 1996, 9623221; May 23, 1997, 9710514

Int. Cl. H01L *21/3205;21/4763;21/00;21/84*

U.S. Cl. 438—592 **3 Claims**



1. A method of manufacturing an electronic device comprising a thin-film transistor, including the steps of forming source and drain electrodes on a substrate, depositing a semiconductor film to provide a channel region of the thin-film transistor between the source and drain electrodes, depositing a gate dielectric on an upper face of the semiconductor film, and forming a gate electrode on the gate dielectric, characterised by depositing a film of chromium nitride to provide at least an upper part of the source and drain electrodes before depositing the semiconductor film.

US 6,410,412 B1

METHODS FOR FABRICATING MEMORY DEVICES

Kenichi Taira; Noriyuki Kawashima; Takashi Noguchi; Dharam Pal Gosain, and Setsuo Usui, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

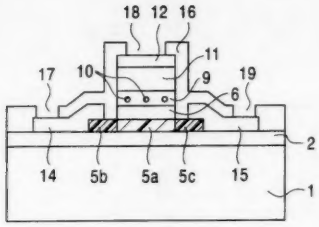
Filed Sep. 15, 2000, Appl. No. 663,006

Claims priority, application Japan, Sep. 16, 1999, 11-261969

Int. Cl. H01L *21/4763*

U.S. Cl. 438—594 **19 Claims**

1. A method for fabricating a memory device comprising the steps of:



forming on a substrate a semiconductor film and treating said semiconductor film by a first laser annealing so as to have a polycrystalline structure;

forming on the semiconductor film a semiconductor dot forming film having a non-stoichiometric composition with an excessive content of a semiconductor element; and

dispersing semiconductor dots within the semiconductor dot forming film by a second laser annealing thereby to produce semiconductor dots;

in which,

a pulse energy density of the laser used for the first laser annealing is larger than a pulse energy density of the laser used for the second laser annealing.

US 6,410,413 B2

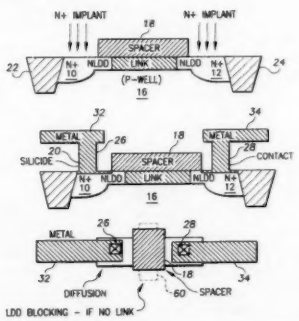
SEMICONDUCTOR DEVICE WITH TRANSPARENT LINK AREA FOR SILICIDE APPLICATIONS AND FABRICATION THEREOF

Gregory Stuart Scott, Santa Clara; Emmanuel de Muizon, Fremont, and Martin Harold Manley, Saratoga, all of Calif., assignors to Koninklijke Philips Electronics N.V. (KPENV), Eindhoven, Netherlands

Division of application No. 09/271,737, filed on Mar. 18, 1999, now Pat. No. 6,326,675. This application Jul. 24, 2001, Appl. No. 912,194.

Int. Cl. H01L *21/44*

U.S. Cl. 438—601 **9 Claims**



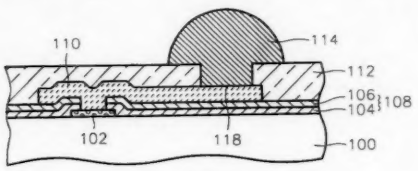
1. A method of fabricating a semiconductor device, comprising:

forming a dopable region between two regions over a substrate region in the semiconductor device, the substrate region doped to achieve a first polarity type, wherein the two regions are doped to achieve a second polarity type that is opposite the first polarity type, and wherein the dopable region is adapted to selectively link the two regions when doped to achieve the second polarity type;

over the dopable region and extending over a portion of each of the two regions, forming a dielectric that is adapted to inhibit silicide formation over edges of the dopable region; and

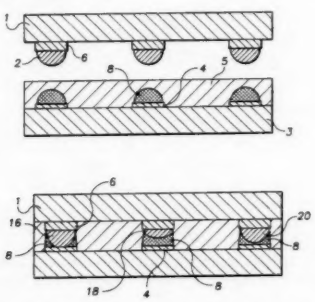
siliciding adjacent the dielectric over another portion of at least one of the two regions.

US 6,410,414 B1
METHOD FOR FABRICATING A SEMICONDUCTOR DEVICE
Joo-hern Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea
Filed Oct. 12, 1999, Appl. No. 416,403
Claims priority, application Rep. of Korea, Dec. 28, 1998, 98-59417
Int. Cl. H01L *21/44*
U.S. Cl. 438—612 **24 Claims**



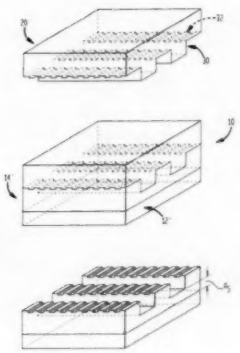
1. A method for fabricating a semiconductor device, comprising:
(a) forming a top metal layer including a bondpad on an integrated circuit including a memory cell;
(b) forming a passivation layer on the top metal layer, for preventing penetration of moisture or impurities;
(c) pattering the passivation layer to expose the bondpad;
(d) forming a metal pattern on the passivation layer connected to the bondpad for bondpad redistribution; and
(e) forming a plurality of insulating layers including a benzo cyclo butene (BCB) layer and a polymer layer on the metal pattern.

US 6,410,415 B1
FLIP CHIP MOUNTING TECHNIQUE
Richard H. Estes, Hollis; James E. Clayton, Chester, both of N.H.; Koji Ito; Masanori Akita, both of Otsu, Japan; Toshihiro Mori, Moriyama, Japan, and Minoru Wada, Saitama, Japan, assignors to Polymer Flip Chip Corporation, Billerica, Mass., and Toray Engineering Co., Ltd., Tokyo, Japan
Continuation-in-part of application No. 09/378,847, filed on Aug. 23, 1999, now Pat. No. 6,189,208, which is a continuation-in-part of application No. 09/274,748, filed on Mar. 23, 1999, now Pat. No. 6,219,911. This application Nov. 28, 2000, Appl. No. 724,019.
This patent is subject to a terminal disclaimer.
Int. Cl. H01L *21/44*
U.S. Cl. 438—612 **39 Claims**



1. A method for mounting a flip chip on a substrate, comprising the steps of:
forming electrically conductive polymer bumps on bond pads of a flip chip;
at least partially hardening the flip chip polymer bumps;
forming electrically conductive polymer bumps on bond pads of a substrate;
applying a layer of electrically insulating adhesive paste on the substrate, covering the substrate polymer bumps with the adhesive;
aligning the bond pads of the flip chip with the bond pads of the substrate;
pushing the at least partially hardened flip chip polymer bumps through the substrate adhesive and at least partially into the substrate polymer bumps.

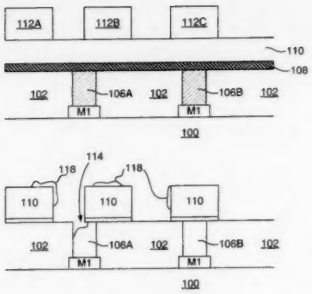
US 6,410,416 B1
ARTICLE COMPRISING A HIGH-RESOLUTION PATTERN ON A NON-PLANAR SURFACE AND METHOD OF MAKING THE SAME
Ananth Dodabalapur, Millington; John A. Rogers, New Providence, and Richart Elliott Slusher, Lebanon, all of N.J., assignors to Agere Systems Guardian Corp., Orlando, Fla.
Filed May 28, 1999, Appl. No. 322,471
Int. Cl. H01L *21/44*
U.S. Cl. 438—615 **8 Claims**



1. An article comprising an optical or electronic device having a substrate with a non-planar surface including a patterned layer having a resolution of about 30 μm or smaller, the patterned layer formed directly on the non-planar surface with the use of a relief member comprising an elastomeric or mechanically flexible material.

US 6,410,417 B1
METHOD OF FORMING TUNGSTEN INTERCONNECT AND VIAS WITHOUT TUNGSTEN LOSS DURING WET STRIPPING OF PHOTORESIST POLYMER
Nien-Yu Tsai, Taipei; Hong-Long Chang; Chun-Wei Chen, both of Hsin-Chu, and Ming-Li Kung, Chi-Lung, all of Taiwan, assignors to ProMOS Technologies, Inc., Hsinchu, Taiwan
Filed Nov. 5, 1998, Appl. No. 186,757
Int. Cl. H01L *21/4763;21/461;21/3065;21/47*
U.S. Cl. 438—618 **3 Claims**

1. A method of forming a metal interconnect structure and via plugs over a dielectric layer having a plurality of vias formed therein, the method comprising the steps of:
forming tungsten via plugs in said plurality of vias;
depositing a metal layer over said dielectric layer and said plurality of tungsten via plugs;
patterning and etching said metal layer using a photoresist layer to form said metal interconnect structure;



removing said photoresist layer in an asher using a combination of oxygen plasma and water vapor, said ratio of oxygen plasma and water vapor being less than one; and

performing a wet strip on said metal interconnect structure.

US 6,410,418 B1

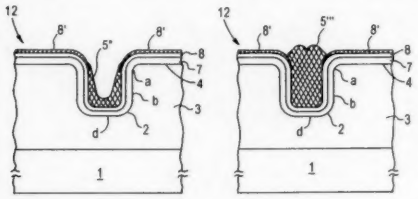
RECESS METALLIZATION VIA SELECTIVE INSULATOR FORMATION ON NUCLEATION/SEED LAYER

Kai Yang, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Provisional application No. 60/149,433, filed on Aug. 18, 1999. This application Aug. 17, 2000, Appl. No. 639,796.

Int. Cl. H01L *21/4763*

U.S. Cl. 438—626 **18 Claims**



1. A method of forming a layer of an electrically conductive material filling at least one recess formed in a substrate surface, which method comprises the sequential steps of:

providing a substrate having a surface comprising at least one recess formed therein, said recess comprising:

(a) a mouth surface portion at the upper end thereof and bordering an adjacent, non-recessed substrate surface portion;

(b) an interior wall surface portion; and

(c) a bottom surface portion at the lower end thereof;

providing an electrically conductive nucleation/seed layer over recess surface portions (a), (b), (c), and extending over the adjacent, non-recessed substrate surface portion;

selectively rendering non-conductive exposed surfaces of said nucleation/seed layer formed over recess surface portion (a) and adjacent, non-recessed substrate surface portion; and

filling said recess with a layer of an electrically conductive material by electroplating said layer on the nucleation/seed layer over recess surface portions (b) and (c), with substantially no electroplating occurring on the surfaces of said nucleation/seed layer over said recess surface portion (a) and said adjacent, non-recessed substrate surface portion rendered non-conductive;

whereby occlusion and/or pinching off of the recess mouth portion (a) during said electroplating due to formation thereon of overhanging portions of said conductive material layer is prevented and unnecessary electroplating on non-recessed portions of the substrate surface is minimized.

US 6,410,419 B1

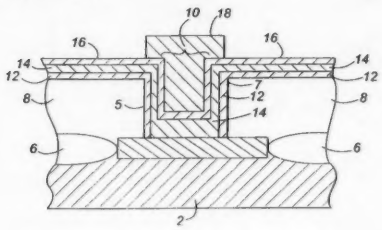
SILICON CARBIDE BARRIER LAYERS FOR POROUS LOW DIELECTRIC CONSTANT MATERIALS

Sailesh Mansinh Merchant; Sudhanshu Misra, and Pradip Kumar Roy, all of Orlando, Fla., assignors to Agere Systems Guardian Corp., Orlando, Fla.

Division of application No. 09/383,753, filed on Aug. 26, 1999, now Pat. No. 6,100,587. This application Aug. 7, 2000, Appl. No. 633,241.

Int. Cl. H01L *21/4763*

U.S. Cl. 438—628 **12 Claims**



1. A method of inhibiting the introduction of moisture to a porous dielectric comprising:

providing a porous dielectric substrate having a conductor;

forming a via through the porous dielectric substrate;

exposing the conductor;

depositing a SiC-containing material onto the porous dielectric substrate and into the via;

depositing a metal into the via.

US 6,410,420 B2

METHOD OF FABRICATING SILICIDE PATTERN STRUCTURES

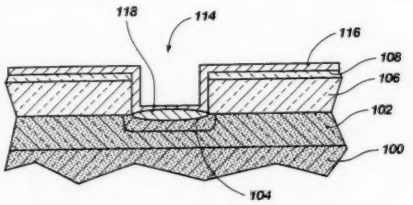
Salman Akram, and Y. Jeff Hu, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of application No. 09/136,384, filed on Aug. 19, 1998, now Pat. No. 6,235,630. This application Feb. 28, 2001, Appl. No. 795,882.

This patent is subject to a terminal disclaimer.

Int. Cl. H01L *21/4763*

U.S. Cl. 438—630 **16 Claims**



1. A method for forming a contact interface, comprising:

providing a substrate comprising semiconductor material;

forming a first layer comprising dielectric material over said semiconductor material;

forming a second layer comprising barrier material over said first layer;

exposing at least a portion of at least one active-device region formed in said semiconductor material through said first and second layers;

disposing an electrically conductive silicidable material different from said barrier material into contact with at least said portion of said at least one active-device region;

annealing said electrically conductive silicidable material to said at least one active-device region so as to form a silicide contact; and

removing said second layer following said annealing.

US 6,410,421 B1

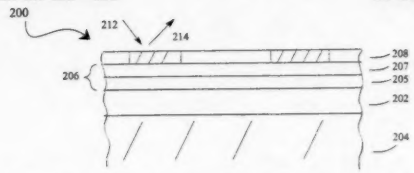
SEMICONDUCTOR DEVICE WITH ANTI-REFLECTIVE STRUCTURE AND METHODS OF MANUFACTURE

Kouros Ghandehari, and Samit Sengupta, both of San Jose, Calif., assignors to Koninklijke Philips Electronics N.V., Eindhoven, Netherlands

Division of application No. 08/919,911, filed on Aug. 28, 1997, now Pat. No. 6,057,587. This application Apr. 28, 2000, Appl. No. 560,939.

Int. Cl. H01L *21/4763*

U.S. Cl. 438—636 **20 Claims**



1. A method of making a semiconductor device, the method comprising:

forming a metal layer over a substrate of the semiconductor device;

forming an anti-reflective structure over the metal layer, the anti-reflective structure comprising indium tin oxide; and

forming a photoresist layer over the anti-reflective structure, wherein the anti-reflective structure, in the presence of the photoresist layer, reflects no greater than about 3% of light having a wavelength in the range of about 190–300 nm.

US 6,410,422 B1

METHOD OF FORMING A LOCAL INTERCONNECT CONTACT OPENING

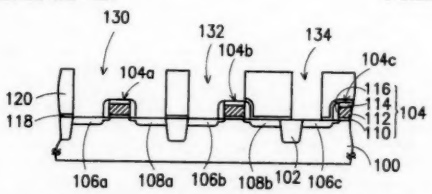
Gow-Wei Sun, Taipei Hsien, and Pei-Jen Wang, Hsinchu, both of Taiwan, assignors to United Microelectronics Corp., Hsinchu, Taiwan

Filed Oct. 10, 2000, Appl. No. 684,476

Claims priority, application Taiwan, Sep. 25, 2000, 89119722 A

Int. Cl. H01L *21/4763*

U.S. Cl. 438—637 **6 Claims**



1. A method of forming contact openings having different depths and different opening sizes, comprising:

providing a substrate, wherein a plurality of devices is formed on the substrate;

forming a liner layer to cover the devices;

forming a dielectric layer at least having a first depth and a second depth over the liner layer;

forming a photoresist layer over the dielectric layer to expose locations of contact openings;

performing a one-step etching process using a $C_5F_8/CO/O_2/Ar$ etching gas and using the liner layer as an etching stop to etch the dielectric layer exposed by the photoresist layer, wherein after the etching process, a local interconnect contact opening, a share contact opening, and a borderless opening are formed to expose the liner layer, both the local interconnect opening and the share contact opening have a first depth and a second depth, an opening size of the local interconnect opening is larger than an opening size of the share contact opening, and an opening size of the share contact opening is larger than an opening size of the borderless opening;

removing the liner layer exposed by the local interconnect opening, the share contact opening, the borderless contact opening to exposes the devices; and removing the photoresist layer.

US 6,410,423 B1

SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF

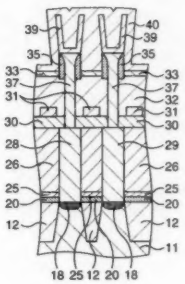
Toru Anezaki, and Shinichiroh Ikemasu, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 27, 2000, Appl. No. 696,945

Claims priority, application Japan, Oct. 27, 1999, 11-304936; Oct. 24, 2000, 2000-323479

Int. Cl. H01L *21/4763;21/8242*

U.S. Cl. 438—637 **15 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

forming a first insulating film above a semiconductor substrate;

forming a second insulating film directly on said first insulating film;

forming a third insulating film directly on said second insulating film, said third insulating film having a low etching rate in relation to a first etchant for said first insulating film;

forming an opening portion so as to extend through said third and second insulating films up to said first insulating film;

forming a spacer on the side wall of said opening portion, said spacer having a low etching rate in relation to said first etchant for said first insulating film;

forming a contact hole so as to extend through said first insulating film, using said third insulating film and said spacer as masks;

filling said opening portion and said contact hole with a first conductive material to form a contact plug; and

selectively removing said third insulating film using a second etchant whose etching rate to said second insulating film is low.

US 6,410,424 B1

PROCESS FLOW TO OPTIMIZE PROFILE OF ULTRA SMALL SIZE PHOTO RESIST FREE CONTACT

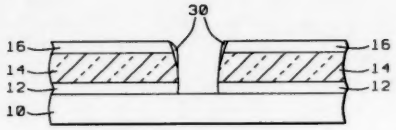
Ming-Huan Tsai, Chupei; Chung-Long Chang, Dou-Liu; Chi-Ming Wu, Taipei, and Hun-Jan Tao, Hsinchu, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin-chu, Taiwan

Filed Apr. 19, 2001, Appl. No. 837,599

Int. Cl. H01L *21/4763*

U.S. Cl. 438—637 **26 Claims**

1. A method for forming a contact hole on a semiconductor substrate, an etch stop layer having been deposited on the surface of said substrate, a layer of dielectric having been deposited on the surface of the etch stop layer, a layer of hard mask material having been deposited on the surface of the layer of dielectric, a layer of photoresist having been deposited on the surface of the layer of



hard mask material, the layer of photoresist comprising a hole, comprising the steps of:

performing a first anisotropic etching process in a downward direction to remove the layer of hard mask material under the hole down to the surface of the layer of dielectric to form a hole in the layer of hard mask material;

removing the layer of photoresist from the surface of the layer of hard mask material;

performing a second anisotropic etching process in a downward direction to remove the layer of dielectric under the hole down in the layer of hard mask material to the surface of the layer of etch stop to form a recess having sidewalls and a bottom in the layer dielectric wherein polymer material remains at the bottom and the sidewalls of the recess following this second anisotropic etching process;

performing an in-situ plasma cleaning process to entirely remove the polymer material remaining at the bottom and the sidewalls of the recess;

performing a third in-situ anisotropic etching process in a downward direction to remove the layer of etch stop from the bottom of the recess created in the layer of dielectric down to the surface of the substrate to form a contact hole having sidewalls and a bottom surface in addition to having an orifice;

depositing in a downward direction a thin layer of oxide over the surface of the layer of hard mask material whereby said thin layer of oxide is deposited on the sidewalls and bottom surface of the contact hole; and

performing a pre-barrier metal sputter of the thin layer of oxide, removing the thin layer of oxide from the surface of the layer of hard mask material and the bottom of the contact hole, further partially removing the thin layer of oxide from the sidewalls of the contact hole, said removal of the thin layer of oxide from the sidewalls of the contact hole being highest at the orifice of the contact hole and gradually declining when proceeding from the orifice towards the bottom of the contact hole, said step of pre-barrier metal argon sputter using argon as an etchant at a temperature of between about 120 and 160 degrees C. and a pressure of between about 0.30 and 0.40 Torr for a time of between about 33 and 39 seconds using a dry etch process.

US 6,410,425 B1

INTEGRATED CIRCUIT WITH STOP LAYER AND METHOD OF MANUFACTURING THE SAME

Christophe Verove, Saint Martin d'Hères, France, assignor to STMicroelectronics S.A., Gentilly, France

Filed Apr. 15, 1999, Appl. No. 292,464

Claims priority, application France, Apr. 16, 1998, 98-04754

Int. Cl. H01L *21/4763;21/44*

U.S. Cl. 438—638 **6 Claims**

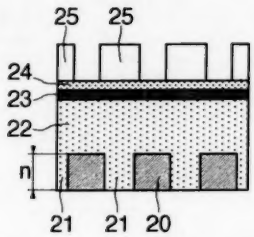
1. A method of manufacturing an integrated circuit, said method comprising the steps of:

depositing first and second stop layers on a first dielectric layer that covers metallization lines of a first metallization level;

selectively etching the second stop layer with respect to the first stop layer;

selectively etching the first stop layer with respect to the first dielectric layer;

depositing a second dielectric layer so as to cover the first and second stop layers and the first dielectric layer;



selectively etching the first and second dielectric layers with respect to the first and second stop layers so as to form trenches in the second dielectric layer and holes in the first dielectric layer; and

depositing metal in the holes and trenches so as to form vias in the holes and metallization lines of a second metallization level in the trenches, each of the vias connecting at least one of the metallization lines of the first metallization level and at least one of the metallization lines of the second metallization level.

US 6,410,426 B1

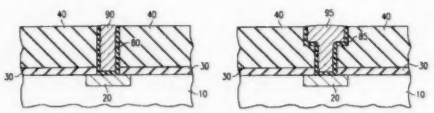
DAMASCENE CAP LAYER PROCESS FOR INTEGRATED CIRCUIT INTERCONNECTS

Guoqiang Xing, and Ping Jiang, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 9, 2001, Appl. No. 901,392

Int. Cl. H01L *21/4763*

U.S. Cl. 438—638 **6 Claims**



1. A method for forming interconnects, comprising:

providing a silicon substrate containing one or more electronic devices;

forming a first dielectric layer over said silicon substrate;

forming a second dielectric layer over said first dielectric layer wherein the dielectric constant of the second dielectric layer is less than 3.0;

forming a capping layer on said second dielectric layer wherein said capping layer consists of a material selected form the group consisting of titanium aluminide (TiAl), titanium aluminum nitride (TiAlN), titanium nitride (TiN), aluminum nitride (AlN), tantalum aluminide (TaAl), and tantalum aluminum nitride (TaAlN);

forming a trench in said second dielectric; and

filling said trench with a conducting material.

4. A method for forming integrated circuit interconnects, comprising:

providing a silicon substrate containing one or more electronic devices;

forming a first dielectric layer over said silicon substrate;

forming a second dielectric layer over said etch stop layer wherein the dielectric constant of the second dielectric layer is less than 3.0;

forming a capping layer on said second dielectric layer wherein said capping layer consists of a material selected form the group consisting of titanium aluminide (TiAl), titanium aluminum nitride (TiAlN), titanium nitride (TiN), aluminum nitride (AlN), tantalum aluminide (TaAl), and tantalum aluminum nitride (TaAlN);

forming a first trench in said second dielectric wherein said first trench has a first width; forming a second trench in said second dielectric wherein said second trench has a second

width different from said first width and said second trench is positioned over said first trench; and

filling said first and second trench with a conducting material.

US 6,410,427 B1

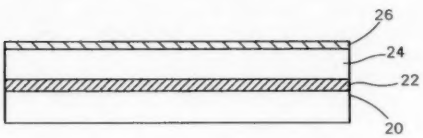
METAL SILICIDATION METHODS AND METHODS FOR USING SAME

Jeff Hu, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of application No. 08/803,528, filed on Feb. 20, 1997, now Pat. No. 6,127,249. This application Jan. 25, 2000, Appl. No. 491,113.

Int. Cl. H01L *21/44*

U.S. Cl. 438—655 **42 Claims**



1. A method for use in the fabrication of semiconductor devices, the method comprising the steps of:

forming a titanium film over a surface of a silicon region in an atmosphere including at least one of nitrogen and oxygen;

forming a layer of one of cobalt or nickel over the titanium film; and

performing a thermal treatment for reversal and silicidation of the titanium film and the layer of cobalt or nickel to form cobalt silicide or nickel silicide.

US 6,410,428 B1

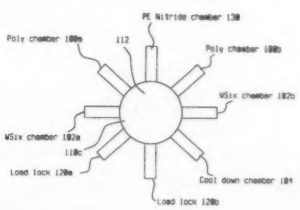
NITRIDE DEPOSITION ON TUNGSTEN-POLYCIDE GATE TO PREVENT ABNORMAL TUNGSTEN SILICIDE OXIDATION

Wen-Hou Chiang, Judung Jen, and Cheng-Sung Huang, Feng-Yuan, both of Taiwan, assignors to ProMos Technologies, Inc., Hsin-Chu, Taiwan

Filed Oct. 3, 2000, Appl. No. 677,745

Int. Cl. H01L *21/44*

U.S. Cl. 438—655 **15 Claims**



1. A method of forming a non-oxidized tungsten silicide layer on a semiconductor wafer, including the steps of:

providing a semiconductor wafer having a silicon substrate within a CVD tool;

forming a tungsten silicide layer over the silicon substrate; and

forming an SiN layer upon the tungsten silicide layer in the absence of O_2;

whereby the tungsten silicide layer is non-oxidized; whereby the tungsten silicide layer is formed in a first chamber within the CVD tool, the semiconductor wafer is then transferred to a second chamber within the CVD tool before formation of the SiN layer upon the tungsten silicide layer.

US 6,410,429 B1

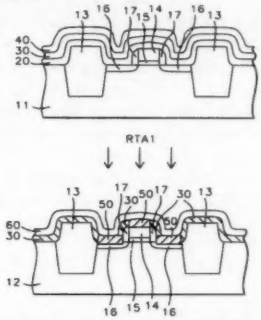
METHOD FOR FABRICATING VOID-FREE EPITAXIAL-$COSI_2$ WITH ULTRA-SHALLOW JUNCTIONS

Chaw Sing Ho, Singapore, Singapore; Kheng Chok Tee, Port Klane, Malaysia; Kin Leong Pey, Singapore, Singapore; G. Karunasiri, Singapore, Singapore; Soo Jin Chua, Singapore, Singapore; Kong Hean Lee, Singapore, Singapore, and Alex Kalhung See, Singapore, Singapore, assignors to Chartered Semiconductor Manufacturing Inc., Milpitas, Calif.

Filed Mar. 1, 2001, Appl. No. 795,113

Int. Cl. H01L *21/44*

U.S. Cl. 438—655 **15 Claims**



1. A method for forming a void-free epitaxial cobalt silicide ($CoSi_2$) layer on an ultra-shallow source/drain junction, comprising the steps of:

a) providing a patterned silicon structure;

b) forming a first titanium layer on said silicon structure;

c) forming a cobalt layer on said first titanium layer;

d) forming a second titanium layer on said cobalt layer;

e) annealing said silicon structure at a temperature of between about 550° C. and 580 °C. in a nitrogen ambient at atmospheric pressure; whereby said cobalt migrates downward and reacts with said silicon structure to form a $CoSi_2$/CoSi layer comprising a $CoSi_2$ seed layer on the surface of the silicon structure, and said first titanium layer migrates upward and said first titanium layer and said second titanium layer react with said nitrogen ambient to form TiN;

f) removing said TiN and unreacted cobalt; and

g) annealing said silicon structure at a temperature of between about 825° C. and 875° C. to convert the $CoSi_2$/CoSi layer to a $CoSi_2$ layer.

US 6,410,430 B1

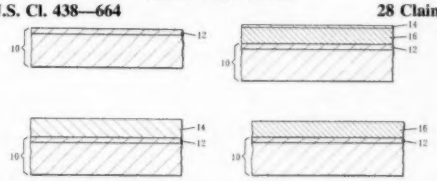
ENHANCED ULTRA-SHALLOW JUNCTIONS IN CMOS USING HIGH TEMPERATURE SILICIDE PROCESS

Kam Leung Lee, Putnam Valley, and Ronnen Andrew Roy, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 12, 2000, Appl. No. 614,597

Int. Cl. H01L *21/44*

U.S. Cl. 438—664 **28 Claims**



1. A method of fabricating an ultra-shallow junction in a substrate of a CMOS device comprising the steps of:

(a) implanting a dopant into a surface of a Si-containing substrate to form a doped region therein;

(b) forming a metal layer on said Si-containing substrate at a temperature of about 350° C. or below; and

(c) heating said metal layer to convert said metal layer into a metal silicide layer while simultaneously activating said doped region, whereby vacancies created by said heating combine with interstitials created in step (a) to substantially eliminate any transient diffusion of said dopant in said Si-containing substrate.

US 6,410,431 B2

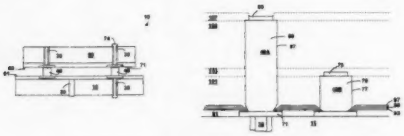
THROUGH-CHIP CONDUCTORS FOR LOW INDUCTANCE CHIP-TO-CHIP INTEGRATION AND OFF-CHIP CONNECTIONS

Claude Louis Bertin, S. Burlington; Wayne John Howell, Williston; William R. Tonti, and Jerzy Maria Zalesinski, both of Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of application No. 09/056,277, filed on Apr. 7, 1998, now Pat. No. 6,222,276. This application Dec. 19, 2000, Appl. No. 746,534.

Int. Cl. H01L *21/44*

U.S. Cl. 438—667 **6 Claims**



1. A method of electrically and thermally connecting a semiconductor device having a front surface with active devices and a back surface to a different level of packaging, comprising:

(a) providing at least one first through-chip conductor and at least one second through-chip conductor;

(b) electrically passing a first characteristic through the first through-chip conductor, from said active devices of said semiconductor device to said different level of packaging, wherein the first characteristic comprises an electrical/physical characteristic; and

(c) passing a second characteristic through the second through-chip conductor to said back surface of said semiconductor device, wherein the second characteristic comprises a thermal characteristic;

wherein said step b) further comprises the steps of:

b1) providing at least one chip connector; and

b2) electrically connecting said active devices of said semiconductor device to said different level of packaging with said chip connector;

wherein said step b1) further comprises:

1) depositing a first sacrificial layer on said semiconductor device;

2) etching a pair of first via holes in said first sacrificial layer;

3) plating a first conductive material in at least one of said first via holes;

4) depositing a second sacrificial layer on said first sacrificial layer;

5) etching a second via hole in said second sacrificial layer, wherein said second via hole connects with at least one of said first via holes;

6) plating a second conductive material in said second via hole, and said first via hole connected therewith; and

7) removing said first and second sacrificial layer.

US 6,410,432 B1

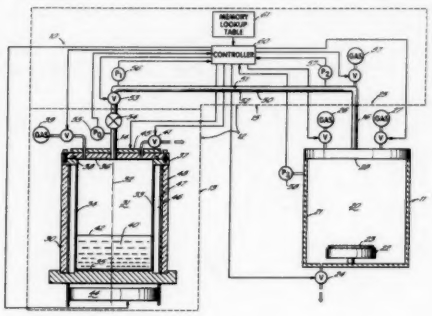
CVD OF INTEGRATED TA AND TAN_X FILMS FROM TANTALUM HALIDE PRECURSORS

John J. Hautala, Beverly, and Johannes F. M. Westendorp, Rockport, both of Mass., assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Apr. 27, 1999, Appl. No. 300,632

Int. Cl. C23C *16/08*

U.S. Cl. 438—680 **20 Claims**



1. A method of depositing a tantalum (Ta) barrier film and a tantalum nitride (TaN_x) barrier film on a semiconductor device substrate having a temperature in the range of about 300° C.–500° C., the method comprising depositing said Ta film by a plasma enhanced CVD process including providing a vapor of a tantalum pentachloride precursor to a reaction chamber containing said substrate by heating said precursor to a temperature sufficient to vaporize said precursor and combining said vapor in said reaction chamber with a process gas consisting essentially of hydrogen and optionally one or more of argon and helium, and generating a plasma in said combined vapor and process gas and reacting said combined vapor and process gas in the presence of said plasma to deposit said Ta, and depositing said TaN_x film by a CVD process selected from the group consisting of: (a) thermal CVD including combining said vapor above said substrate with a process gas consisting essentially of nitrogen and hydrogen and optionally one or more of argon and helium by providing said process gas to said reaction chamber concurrently with providing said vapor to said reaction chamber to deposit said TaN_x, and (b) plasma enhanced CVD including combining said vapor above said substrate with a process gas consisting essentially of N_2 and H_2 and optional inert gases to deposit said TaN_x wherein the deposit Ta and TaN_x films each contain less than 2 atomic percent chlorine.

US 6,410,433 B1

THERMAL CVD OF TAN FILMS FROM TANTALUM HALIDE PRECURSORS

John J. Hautala, Beverly, and Johannes F. M. Westendorp, Rockport, both of Mass., assignors to Tokyo Electron Limited, Tokyo, Japan

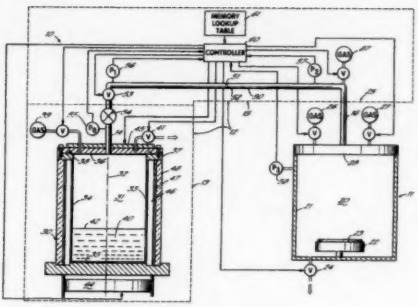
Filed Apr. 27, 1999, Appl. No. 300,661

This patent is subject to a terminal disclaimer.

Int. Cl. H01L *21/44*

U.S. Cl. 438—680 **18 Claims**

1. A method of depositing a tantalum nitride (TaN_x) barrier film on a semiconductor device substrate having a temperature in the range of about 300° C.–500° C., the method comprising providing a vapor of a tantalum pentachloride precursor to a reaction chamber containing said substrate by heating said precursor to a temperature sufficient to vaporize said precursor, then combining said vapor above said substrate with a process gas consisting essentially of nitrogen and hydrogen and optionally one or more of argon and helium by providing said process gas to said reaction chamber concurrently with providing said vapor to said reaction chamber to deposit said TaN_x on said substrate by a thermal chemical vapor



deposition (CVD) process, wherein the deposited TaN_x film contains less than 2 atomic percent chlorine.

US 6,410,434 B1

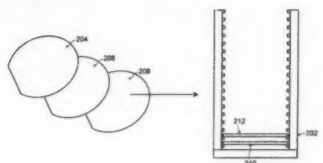
METHOD AND APPARATUS FOR FORMATION OF IN-SITU DOPED AMORPHOUS SEMICONDUCTOR FILM

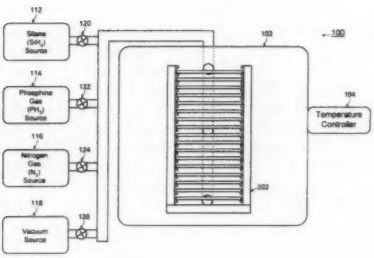
Balaraman Mani, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 9, 2000, Appl. No. 521,591

Int. Cl. H01L *21/44*

U.S. Cl. 438—680 **33 Claims**





1. A method for forming a doped amorphous semiconductor film on a plurality of semiconductor wafers, the method including the steps of:

A. placing said plurality of semiconductor wafers in a reaction chamber;

B. setting a pressure within said reaction chamber to be less than approximately 1.0 Torr;

C. setting a temperature within the reaction chamber to a predetermined temperature in a range of from about 500° Celsius to about 550° Celsius; and

D. flowing a semiconductor film reactant and a dopant reactant into said reaction chamber through at least two gas inlets,

each gas inlet being disposed on a respective location of said reaction chamber near said plurality of semiconductor wafers;

wherein said doped amorphous semiconductor film is formed from said semiconductor film reactant with in-situ doping from said dopant reactant on said plurality of semiconductor wafers in a LPCVD (Low Pressure Chemical Vapor Deposition) process;

and wherein said plurality of wafers are placed into a boat holding said plurality of wafers in a stacked configuration along a vertical dimension of said reaction chamber, and wherein said at least two gas inlets are arranged linearly along said vertical dimension of said reaction chamber near said stacked configuration of said plurality of semiconductor wafers;

and wherein each of said at least two gas inlets carries both of said semiconductor film reactant and said dopant reactant;

and wherein said dopant reactant flows through a bottom gas inlet of said at least two gas inlets with a first flow rate, and wherein said dopant reactant flows through an upper gas inlet of said at least two gas inlets with a second flow rate;

and wherein said upper gas inlet is disposed above said bottom gas inlet along said vertical dimension of said reaction chamber, and wherein said second flow rate of said dopant reactant through said upper gas inlet is greater than said first flow rate of said dopant reactant through said bottom gas inlet.

US 6,410,435 B1

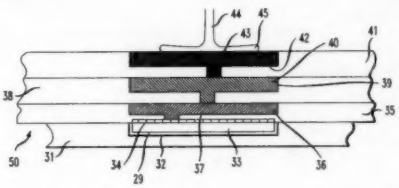
PROCESS FOR FABRICATING COPPER INTERCONNECT FOR ULSI INTEGRATED CIRCUITS

Vivian W. Ryan, Hampton, N.J., assignor to Agere Systems Guardian Corp., Orlando, Fla.

Filed Oct. 1, 1999, Appl. No. 410,686

Int. Cl. H01L *21/44*

U.S. Cl. 438—687 **15 Claims**



1. A method of manufacturing an integrated circuit comprising:

a. providing a wafer having an inter-level dielectric film and a barrier layer;

b. depositing a seed layer of copper on said barrier layer;

c. electroplating copper to a thickness sufficient to fill any valleys in said inter-level dielectric film and cover an entire top surface of said wafer;

d. chemical mechanical polishing said top surface to remove i) any excess portions of copper caused by said electroplating and ii) selected portions of said inter-level dielectric film;

e. depositing a layer of CrO on said polished top surface to cover remaining portions of said copper;

f. depositing a passivation layer on said layer of CrO and portions of said inter-level dielectric film; and

g. etching said passivation layer to form a via that exposes a selected portion of said layer of CrO.

US 6,410,436 B2

METHOD OF CLEANING POROUS BODY, AND PROCESS FOR PRODUCING POROUS BODY, NON-POROUS FILM OR BONDED SUBSTRATE

Kenji Yamagata, Sagamihara, and Satoshi Matsumura, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

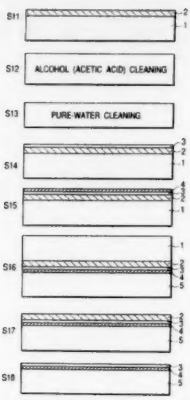
Filed Mar. 16, 2000, Appl. No. 526,541

Claims priority, application Japan, Mar. 26, 1999, 11-083599

Int. Cl. H01L *21/302;21/46;21/461*

U.S. Cl. 438—689 **63 Claims**

1. A method of cleaning a porous body formed by anodization, comprising the step of cleaning the porous body after the anodiza



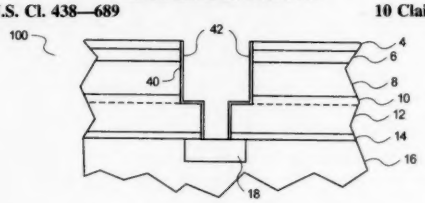
tion is completed, with a cleaning solution containing at least one of an alcohol and acetic acid.

US 6,410,437 B1

METHOD FOR ETCHING DUAL DAMASCENE STRUCTURES IN ORGANOSILICATE GLASS

Janet M. Flanner, Union City, Calif., and Ian Morey, Singapore, Singapore, assignors to Lam Research Corporation, Fremont, Calif.

Filed Jun. 30, 2000, Appl. No. 608,119
Int. Cl. H01L *21/461;21/302*
U.S. Cl. 438—689 **10 Claims**



1. A method for forming a dual damascene etch structure in a wafer, the wafer including a layer of organosilicate glass dielectric, the method comprising the steps of:

first, etching through a major portion of the organosilicate glass dielectric utilizing a first, low selectivity etchant, the first etching step leaving a remainder portion of the organosilicate glass dielectric; and

second, etching away the remainder portion of the organosilicate glass dielectric utilizing a sound, highly selective etchant.

US 6,410,438 B1

METHOD AND DEVICE FOR POLISHING WORK EDGE

Haruo Ozaki, Hachioji, Japan, assignor to Emutech Co., Ltd., Tokyo, Japan

Division of application No. 09/369,261, filed on Aug. 6, 1999, now Pat. No. 6,248,005. This application Oct. 20, 2000, Appl. No. 691,946.
Claims priority, application Japan, Aug. 9, 1998, 10-237986
Int. Cl. H01L *21/302*
U.S. Cl. 438—690 **7 Claims**

1. A method for polishing an edge of a thin plate having at least one surface with a rubber wheel containing abrasives and mounted to a spindle drivable to rotate said rubber wheel in a plane normal to the at least one surface of said thin plate while said thin plate is mounted to a mount portion movable linearly with respect to said rubber wheel, said spindle and said thin plate mounting portion being biased by elastic means in a direction to bring said rubber wheel and said edge of said thin plate in contact with each other, said method comprising the steps of:

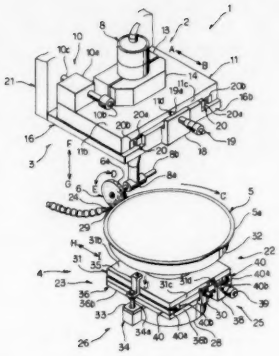
(a) driving said spindle to rotate said rubber wheel in the plane normal to said at least one surface of said thin plate,

(b) moving one of said spindle and said thin plate mounting portion toward and away from the other during a polishing operation,

(c) floating said spindle on a first floating plate movable in a plane normal to the plane in which said rubber wheel is rotated,

(d) floating said thin plate mounting portion on a second floating plate movable in a plane parallel with the plane in which said first plate is floated, and

(e) bringing said rubber wheel and said edge of said thin plate into contact with each other under the bias of first and second compression springs of said elastic means acting respectively on said first and second floating plates.

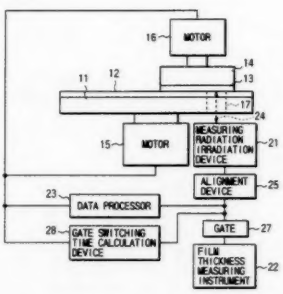


US 6,410,439 B1

SEMICONDUCTOR POLISHING APPARATUS AND METHOD FOR CHEMICAL/MECHANICAL POLISHING OF FILMS

Masako Kodera, Yokohama; Takashi Yoda, Machida, and Motosuke Miyoshi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 16, 2000, Appl. No. 527,528
Claims priority, application Japan, Mar. 17, 1999, 11-071607
Int. Cl. H01L *21/302*
U.S. Cl. 438—691 **3 Claims**



1. A semiconductor polishing method, comprising:

setting a surface to be polished of a wafer held by a wafer holder opposite to the surface of a polishing cloth attached to the surface of a polishing platen;

supplying the surface of the polishing cloth with a polishing slurry;

polishing a film present in the surface of the wafer by bringing the surface of the polishing cloth and the surface of the wafer into contact with each other with a load applied to the wafer;

irradiating the surface of the wafer with measuring radiation at the time of polishing from a measuring radiation irradiation device;

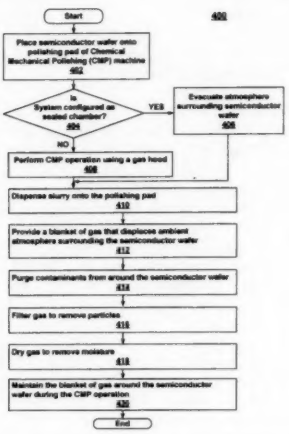
measuring the thickness at a specified site of the film in the middle of polishing on the basis of reflections of the measuring radiation from the surface of the wafer by a film thickness measuring device; and

controlling the timing of opening and closing a gate for conducting the reflections to the film thickness measuring device by a gate control device.

US 6,410,440 B1
METHOD AND APPARATUS FOR A GASEOUS ENVIRONMENT PROVIDING IMPROVED CONTROL OF CMP PROCESS

Charles F. Drill, Boulder Creek, and Milind Weling, San Jose, both of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed May 5, 1999, Appl. No. 305,977
Int. Cl. H01L *21/302*
U.S. Cl. 438—692 **14 Claims**



1. A method for improving a Chemical Mechanical Polishing (CMP) operation on a semiconductor wafer, said method comprising the steps of:

placing a semiconductor wafer onto a polishing pad of a CMP machine;

dispensing a slurry onto said polishing pad;

providing a blanket of gas that displaces the ambient atmosphere surrounding said semiconductor wafer; and

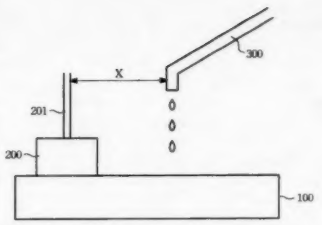
maintaining said blanket of gas around said semiconductor wafer during a CMP operation.

US 6,410,441 B1
AUTO SLURRY DELIVER FINE-TUNE SYSTEM FOR CHEMICAL-MECHANICAL-POLISHING PROCESS AND METHOD OF USING THE SYSTEM

Pao-Kang Niu, Hsin-Chu, Taiwan, assignor to Worldwide Semiconductor Manufacturing Corp., Taiwan

Filed Dec. 13, 1999, Appl. No. 458,827
Int. Cl. H01L *21/302*
U.S. Cl. 438—692 **5 Claims**

1. A method of a slurry deliver fine tune in a chemical mechanical polishing (CMP) system, wherein the CMP system has a slurry



flowing at a flow rate, a turn-table driven by a current, a slurry injector, and a polish head having a wafer thereunder, which method comprises:

varying a flow rate of the slurry in the CMP system and distance between the slurry injector and the polish head of the CMP system;

detecting the current driving the turn-table of the CMP system;

determining whether the current is minimum;

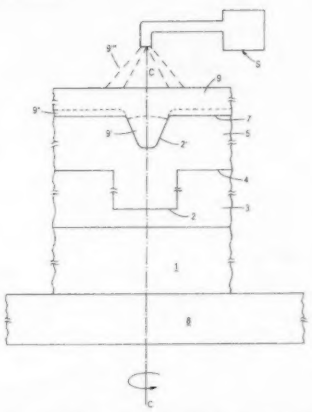
varying the flow rate and the distance to minimize the current; and

sustaining the flow rate and the distance for optimizing the flowing of the slurry.

US 6,410,442 B1
MASK-LESS DIFFERENTIAL ETCHING AND PLANARIZATION OF COPPER FILMS

Kai Yang, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Provisional application No. 60/149,428, filed on Aug. 18, 1999. This application Aug. 17, 2000, Appl. No. 640,187.
Int. Cl. H01L *21/00*
U.S. Cl. 438—692 **23 Claims**



1. A method for mask-less differential etching/planarizing a recess-patterned surface of a layer of copper or copper alloy, which method comprises the sequential steps of:

(a) providing a workpiece having upper and lower opposed major surfaces, the upper major surface comprising a layer of copper or copper alloy and including a recessed area and a non-recessed area;

(b) securing the lower major surface of said workpiece to a facing surface of a movable workpiece holder for providing movement of the workpiece in a direction parallel to said upper surface;

(c) providing a source of a liquid etchant solution, said etchant solution comprising:

i. at least one copper or copper alloy etchant;

ii. a surfactant in an amount sufficient for providing wetting of the copper or copper alloy surface by the etchant solution;

iii. an additive in an amount sufficient for increasing the viscosity of the etchant solution to a level greater than that of the solvent; and

iv. a liquid solvent;

(d) directing etchant solution form said source onto said upper surface of said workpiece while moving the workpiece in a direction parallel to said upper surface, thereby at least partially filling the recessed area with etchant solution and distributing said etchant solution as a film covering the non-recessed area, said film of etchant solution being replenished with fresh etchant solution from said source at a faster rate than the etchant solution filling the recessed area; whereby the rate of etching of the copper or copper alloy within the recessed area is slower than that of the non-recessed area, resulting in differential etching of the recess-patterned surface of the layer of copper or copper alloy; and

(e) continuing the differential etching of step (d) for a time sufficient to reduce the thickness of the non-recessed area of the copper or copper alloy layer, thereby at least partially planarizing said upper surface.

US 6,410,443 B1

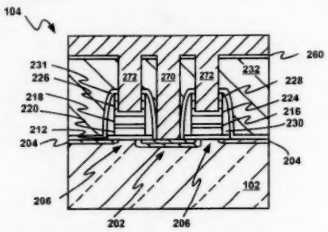
METHOD FOR REMOVING SEMICONDUCTOR ARC USING ARC CMP BUFFING

Steven C. Avanzino; Stephen Keetai Park, both of Cupertino; Kashmir S. Sahota, Fremont; David H. Matsumoto, San Jose, and Mark Ramsbey, Sunnyvale, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Provisional application No. 60/151,093, filed on Aug. 27, 1999. This application Feb. 22, 2000, Appl. No. 507,810.

Int. Cl. H01L *21/302*

U.S. Cl. 438—693 **31 Claims**



1. A method of manufacturing a semiconductor device on a semiconductor substrate, comprising the steps of:

forming a multi-layer structure on an active region on the semiconductor substrate;

forming a source region and a drain region on said active region adjacent said multi-layer structure;

forming sidewall spacers around said multi-layer structure;

forming a dielectric layer over the semiconductor substrate, including said multi-layer structure, said sidewall spacers, said source region and said drain region;

forming an anti-reflective coating layer over said dielectric layer, said anti-reflective coating layer having a top surface;

forming a masking layer over said anti-reflective coating layer;

patterning said masking layer to form a contact mask;

forming a first opening and a second opening in said dielectric layer through said anti-reflective coating layer using said contact mask as a mask, said first opening exposes a portion of said source region and said second opening exposes a portion of said drain region;

filling said first opening and said second opening with a conductive material;

planarizing said conductive material smooth with said top surface of said anti-reflective coating layer; and

removing said anti-reflective coating layer using chemical-mechanical polishing with a non-oxidizer containing slurry to remove said anti-reflective coating layer at a rate which is faster than the removal rates of said dielectric layer or said conductive material.

US 6,410,444 B1

COMPOSITION FOR POLISHING A SEMICONDUCTOR DEVICE AND PROCESS FOR MANUFACTURING A SEMICONDUCTOR DEVICE USING THE SAME

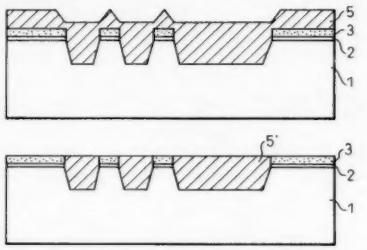
Takanori Kido, and Kagetaka Ichikawa, both of Shiojiri, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Division of application No. 09/622,939, filed as application No. PCT/JP99/00844, filed on Feb. 24, 1999, Provisional application No. 60/081,769, filed on Apr. 15, 1998. This application Sep. 17, 2001, Appl. No. 953,127.

Claims priority, application Japan, Feb. 24, 1998, 10-42288

Int. Cl. H01L *21/302*

U.S. Cl. 438—693 **2 Claims**



1. A process for manufacturing a semiconductor device, comprising the steps of

forming a silicon nitride layer on a semiconductor substrate,

selectively removing a portion of said silicon nitride layer to expose said semiconductor substrate,

etching said semiconductor substrate using said silicon nitride layer as a mask to form a trench,

depositing a silicon oxide layer on said silicon nitride layer and said semiconductor substrate to completely fill said trench with the silicon oxide layer, and

planarization-polishing said silicon oxide layer using said silicon nitride layer as a stopper to selectively remain said silicon oxide in said trench,

wherein said planarization-polishing is performed by using an abrasive composition for polishing a semiconductor device, said composition mainly comprising water, cerium oxide powder and one or more water-soluble organic compound having at least one of a —COOH group, —$COOM_X$ group (wherein M_X is an atom or functional group capable of replacing a H atom to form a salt), a —SO_3H group or a —SO_3M_Y group (wherein M_Y is an atom or functional group capable of replacing a H atom to form a salt), wherein when a silicon nitride layer and a silicon oxide layer separately formed on a semiconductor substrate by the CVD method are independently polished under the same conditions, the ratio of the polishing rate for the latter to that for the former is 10 or more.

US 6,410,445 B1

MANUFACTURING METHOD FOR INTEGRATED SENSOR ARRAYS

Per-Erik Fägerman, Linghem, Sweden, assignor to Appliedsensor Sweden AB, Sweden

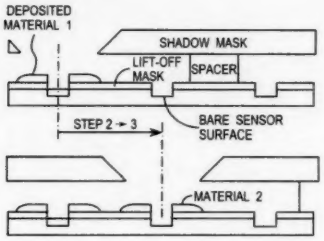
Filed Jan. 25, 2000, Appl. No. 491,020

Claims priority, application Sweden, Jan. 25, 1999, 9900239

Int. Cl. H01L *21/311*

U.S. Cl. 438—695 **11 Claims**

1. A method for fabricating integrated sensor arrays on a common substrate, comprising a first step of developing a resist mask on the surface of the substrate, wherein the resist mask is provided with openings for all areas of the substrate where a deposition is to take place in subsequent steps; a second step in which a first shadow mask is located over the resist mask from the first step and a first deposition of materials takes place in which the first shadow mask screens and protects all openings in the resist mask that are not to be subjected to deposition leaving only those where the

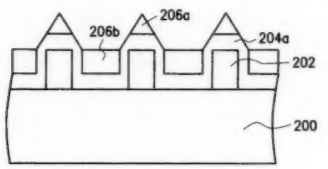


deposition is to take place; a third step in which a second shadow mask is located over the resist mask and a second deposition takes place in areas of the openings in the resist mask on the substrate that are not screened by said second deposition; subsequent steps in which additional shadow masks are used to expose the desired openings in the resist mask to a treatment; and a last step in which after all depositions have been carried out at different openings in the resist mask the last shadow mask is removed and then the resist mask is removed.

US 6,410,446 B1
METHOD FOR GAP FILLING

Cheng-Yuan Tsai, Yunlin Hsien; Chih-Chien Liu, Taipei, and Ming-Sheng Yang, Hsinchu, all of Taiwan, assignors to United Microelectronics Corp., Hsinchu, Taiwan

Filed Mar. 20, 2000, Appl. No. 531,974
Claims priority, application Taiwan, Feb. 14, 2000, 089102402 A
Int. Cl. H01L *21/31*
U.S. Cl. 438—695 **10 Claims**



1. A method of filling a gap, wherein a semiconductor substrate having a plurality of conductive structures formed thereon and a plurality of gaps between the conductive structures to isolate the conductive structures, is provided, comprising the steps of:

performing a first step of a high density plasma chemical vapor deposition (HDPCVD) process to form a dielectric material on the conductive structures and within the gaps, wherein a gas source comprising silane (SiH_4) and oxygen and a sputtering gas are flowed into a deposition chamber for forming the dielectric material;

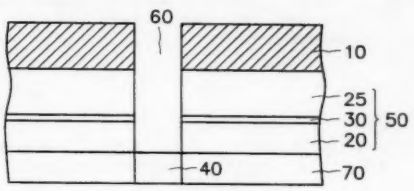
performing a second step of the HDPCVD process to provide an in-situ sputtering treatment in order to remove a part of the dielectric material deposited at top corners of the conductive structures, wherein silane is driven out of the deposition chamber by a pump to provide the in-situ sputtering treatment in the second step; and

performing a third step of the HDPCVD process to continually deposit the dielectric material until the gaps are filled.

US 6,410,447 B2
PROCESS FOR REMOVING PHOTORESIST MATERIAL

Yuan-Chi Pai, Nantou Hsien; Lung-Yi Cheng, Taipei; Cheng-Che Li, Taitung Hsien, and Wei-Chiang Lin, Hsinchu, all of Taiwan, assignors to United Microelectronics Crop., Hsinchu, Taiwan

Filed Jan. 14, 1999, Appl. No. 231,537
Claims priority, application Taiwan, Nov. 26, 1998, 87119485
Int. Cl. H01L *21/302*
U.S. Cl. 438—706 **18 Claims**



1. A process for removing photoresist material on an in-process substrate, comprising the steps of:

providing an organic transparent layer which is to be etched on the in-process substrate;

providing a layer of photoresist material on the organic transparent layer;

performing a first exposure step and a developing step on the photoresist layer, so that the remaining photoresist layer has a pattern that exposes a portion of the organic transparent layer;

performing a second exposure step on the whole remaining developed photoresist layer without using a mask after the developing step;

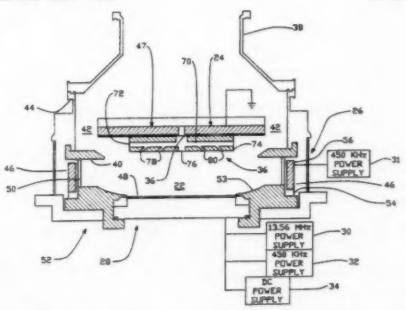
performing a dry-etching on the exposed cover layer with the use of the remaining photoresist layer as a mask; and

removing the remaining photoresist layer by a solvent.

US 6,410,448 B1
PLASMA ETCH REACTOR AND METHOD FOR EMERGING FILMS

Stephen P. DeOrnellas, Santa Rosa; Alferd Cofer, Petaluma, and Robert C. Vail, Windsor, all of Calif., assignors to Tegal Corporation, Petaluma, Calif.

Division of application No. 08/675,093, filed on Jul. 3, 1996, now Pat. No. 6,048,435. This application Aug. 27, 1999, Appl. No. 384,858.
Int. Cl. H01L *21/302*
U.S. Cl. 438—706 **15 Claims**



1. A method for etching a wafer comprising the steps of:

placing the wafer in a reactor chamber in association with a first electrode;

applying first power from a first power source to the first electrode at a voltage of about 1,200 volts;

applying second power from a second power source to the first electrode at a voltage of about 300 volts;

introducing process gasses into the reactor chamber in association with the applying steps;

developing a pressure in the reactor chamber of less than 150 millitorr in association with the applying steps and the introducing step;

controlling a plasma in the reactor chamber with magnetic confinement; and

etching a feature on the wafer;

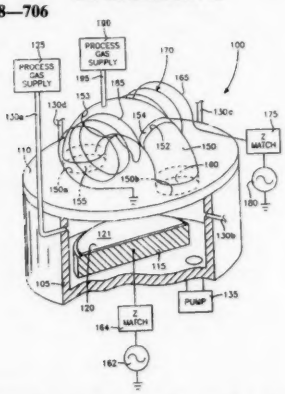
wherein said placing step includes placing a wafer comprising at least one of a film of lead zirconium tantalate (PZT), platinum (Pt), iridium (Ir), bismuth strontium tantalate (Y-1), barium strontium tantalate (BST), iridium oxide (IrO_2), ruthenium (Ru), and ruthenium oxide (RuO_4).

US 6,410,449 B1

METHOD OF PROCESSING A WORKPIECE USING AN EXTERNALLY EXCITED TORROIDAL PLASMA SOURCE

Hiroji Hanawa, Sunnyvale; Yan Ye, Campbell; Kenneth S Collins, San Jose; Kartik Ramaswamy, Santa Clara; Andrew Nguyen, San Jose, and Tsutomu Tanaka, Santa Clara, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Aug. 11, 2000, Appl. No. 636,436
Int. Cl. H01L *21/302*
U.S. Cl. 438—706 **8 Claims**



1. A method of processing a workpiece in a plasma reactor, comprising:

establishing a torroidal path for a plasma current to flow that passes near and transverse to the surface of said workpiece;

maintaining a plasma current in said torroidal path by applying RF power to a portion of said torroidal path away from said surface of said workpiece;

increasing the ion density of the plasma current in the vicinity of said workpiece by constricting the area of a portion of said torroidal path overlying said workpiece.

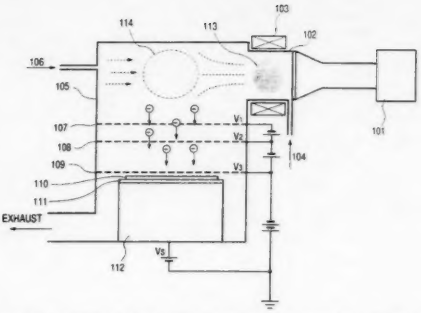
US 6,410,450 B2

PROCESS FOR PRODUCING A SEMICONDUCTOR DEVICE

Hideo Kitagawa, Utsunomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of application No. 09/399,113, filed on Sep. 20, 1999, now Pat. No. 6,217,704. This application Feb. 8, 2001, Appl. No. 778,930.
Claims priority, application Japan, Sep. 22, 1998, 10-268784
Int. Cl. H01L *21/302*
U.S. Cl. 438—710 **3 Claims**

1. A process for producing a semiconductor device, comprising the steps of:



providing an article having a substrate on supporting means in a vacuum vessel;

introducing a first gas containing at least one of halogen and oxygen into a plasma generating space;

feeding electric energy to the first gas in the plasma generating space to generate a plasma;

mixing a second gas having a temperature lower than that of the plasma into the plasma which has been introduced into a negative ion forming space which is distinct from and in communication with the plasma generating space, thereby forming negative ions: and

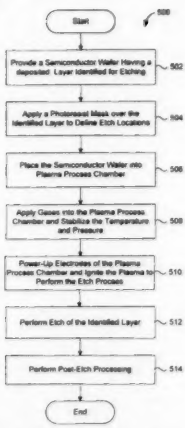
drawing out the negative ions from the negative ion forming space and feeding the negative ions to the article, whereby ashing, etching or cleaning of the article is conducted.

US 6,410,451 B2

TECHNIQUES FOR IMPROVING ETCHING IN A PLASMA PROCESSING CHAMBER

Thomas D. Nguyen, Campbell; George Mueller, San Jose, and Peter McGrath, Roseville, all of Calif., assignors to Lam Research Corporation, Fremont, Calif.

Filed Sep. 27, 1999, Appl. No. 405,949
Int. Cl. H01L *21/302*
U.S. Cl. 438—713 **32 Claims**


Start
Provide a Semiconductor Wafer Having a Deposited Layer Identified for Etching
Apply a Photoresist Mask over the Identified Layer to Define Etch Locations
Place the Semiconductor Wafer into Plasma Process Chamber
Apply Gases into the Plasma Process Chamber and Stabilize the Temperature and Pressure
Power-Up Electrodes of the Plasma Process Chamber and Ignite the Plasma to Perform the Etch Process
Perform Etch of the Identified Layer
Perform Post-Etch Processing
End

1. In a plasma processing chamber for processing a wafer, a method of etching a dielectric layer of material that is deposited on the wafer, the method comprising:

flowing an etchant source gas into the plasma processing chamber, the etchant source gas consisting essentially of C_3F_6 gas and O_2 gas;

striking a plasma that is formed from the etchant source gas;

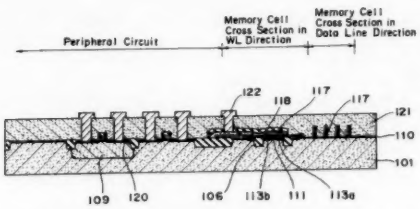
performing an etch process by etching a portion of the dielectric layer of material using the plasma; and

wherein the etch process etches a feature on the dielectric layer, the feature having a difference between pre-etch and post-etch dimensions that is lower than about 0.05 μm.

US 6,410,452 B2
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Naho Nishioka, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 2001, Appl. No. 795,309
Claims priority, application Japan, Jul. 21, 2000, 2000-220590
Int. Cl. H01L *21/302*
U.S. Cl. 438—734 **5 Claims**



1. A method of manufacturing a semiconductor device having a trench isolation structure, comprising the steps of:

patterning a mask film on a semiconductor substrate;

forming a trench by etching said semiconductor substrate by use of said mask film;

filling said trench with an insulating film by repeating the step of depositing the insulating film in said trench and the step of etching the insulating film by sputter etching;

removing said mask film; and

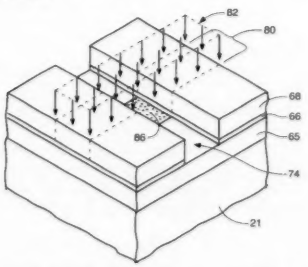
removing said insulating film by etching a predetermined amount of said insulating film filled in said trench,

wherein, by said sputter etching in the step of filling said trench with the insulating film, an edge between a surface of said substrate and an inner wall surface of said trench forms an inclined surface to the surface of said substrate.

US 6,410,453 B1
METHOD OF PROCESSING A SUBSTRATE

Gurtej S. Sandhu, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Sep. 2, 1999, Appl. No. 391,078
Int. Cl. H01L *21/302;21/461*
U.S. Cl. 438—736 **50 Claims**



1. A method of processing a substrate, comprising the steps of:

providing a substrate;

forming a first photoresist on said substrate;

forming light blocking material over said first photoresist;

forming a second photoresist over said light blocking material;

patterning said second photoresist to provide an opening therein that exposes a portion of said light blocking material corresponding to a first pattern;

removing the exposed said light blocking material to uncover a region of said first photoresist;

irradiating only a portion of said uncovered region of said first photoresist;

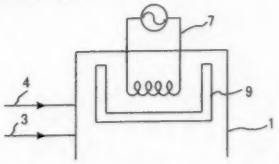
developing and removing the irradiated portion of said first photoresist to form an aperture therein to the substrate; and

processing a region of sad substrate through said aperture.

US 6,410,454 B1
METHOD AND APPARATUS FOR REMOVING CONTAMINANTS FROM THE SURFACE OF A SEMICONDUCTOR WAFER

Seiji Muranaka; Cozy Ban, and Akihiko Osaki, all of Chiyoda-ku, Japan, assignors to Mitsubishi Denki Kabushiki, Tokyo, Japan

Filed Dec. 2, 1997, Appl. No. 982,586
Claims priority, application Japan, Jun. 10, 1997, 9-152184
Int. Cl. B01J *19/08*
U.S. Cl. 438—758 **7 Claims**



1. A method for manufacturing a semiconductor device, said method comprising the steps of:

generating hydrogen radicals from hydrogen gas or hydrogen halide gas by heating said hydrogen gas or hydrogen halide gas by means of a hot filament in the presence of a catalyst for generating hydrogen radicals;

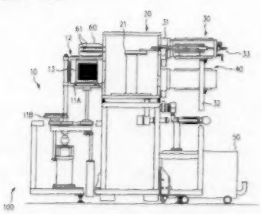
removing contaminants on the surface of said semiconductor wafer in said film-forming chamber using said hydrogen radicals; and

forming either a conductive film or an insulating film on said surface of said wafer in said same film-forming chamber immediately after said removal of said contaminants.

US 6,410,455 B1
WAFER PROCESSING SYSTEM

Hiromitsu Kuribayashi, Kanagawa, Japan, and Woo Sik Yoo, Palo Alto, Calif., assignors to WaferMasters, Inc., San Jose, Calif., and Tokyo Electron Limited, Tokyo, Japan

Filed Nov. 30, 1999, Appl. No. 451,677
Int. Cl. H01L *21/31;21/469;* **B65G** *1/133*
U.S. Cl. 438—758 **11 Claims**



1. A wafer processing system comprising:

a loading station having a platform for rotating a wafer carrier from a first position to a second position, the loading station having an elevator for raising the wafer carrier into a load lock;

a first reactor; and,

a robot having extension, rotational, and vertical motion, the robot being operable to move a wafer from the wafer carrier to the first reactor.

US 6,410,456 B1
METHOD AND APPARATUS FOR INSITU VAPOR GENERATION

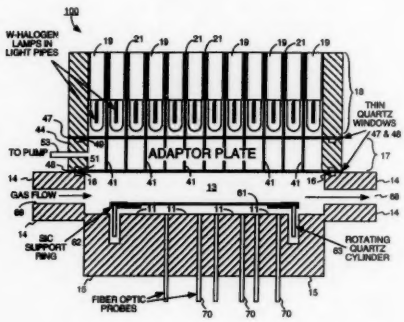
Christian M. Gronet, Portola Valley; Peter A. Knoot, San Carlos; Gary E. Miner, Newark; Guangcai Xing, Fremont; David R. Lopes, Sunnyvale, and Satheesh Kuppurao, Santa Clara., all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of application No. 09/507,946, filed on Feb. 22, 2000, now Pat. No. 6,159,866, which is a continuation of application No. 09/033,391, filed on Mar. 2, 1998, now Pat. No. 6,037,273, and a continuation-in-part of application No. 08/893,774, filed on Jul. 11, 1997, now abandoned. This application Nov. 21, 2000, Appl. No. 718,443.

This patent is subject to a terminal disclaimer.

Int. Cl. C23C *16/455*

U.S. Cl. 438—769 **16 Claims**



1. A method of forming an oxide comprising:

placing a substrate in a chamber;

providing an oxygen containing gas into said chamber;

providing a hydrogen containing gas into said chamber wherein the combined partial pressure of said hydrogen containing gas and said oxygen containing gas is less than or equal to 150 torr during said reaction;

reacting said oxygen containing gas and said hydrogen containing gas in said chamber near said substrate to form an ambient; and

oxidizing said substrate with said ambient.

US 6,410,457 B1
METHOD FOR IMPROVING BARRIER LAYER ADHESION TO HDP-FSG THIN FILMS

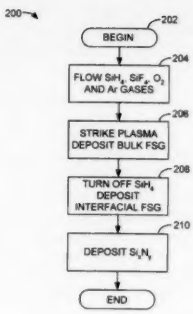
Hichem M'Saad, Santa Clara; Dana Tribula, Palo Alto; Manoj Vellaikal, Santa Clara; Farhad Moghadam, Saratoga, and Sameer Desai, Menlo Park, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Provisional application No. 60/151,855, filed on Sep. 1, 1999. This application May 11, 2000, Appl. No. 569,744.

Int. Cl. H01L *21/31;21/469*

U.S. Cl. 438—778 **24 Claims**

1. A method for depositing a thin film on a substrate in a process chamber, the method comprising:



(a) providing a gaseous mixture to the chamber, the gaseous mixture comprising flows of silane, a gas that contains both fluorine and silicon, and a gas that contains oxygen;

(b) generating a plasma from the gaseous mixture;

(c) depositing a bulk portion of a fluorinated silicate glass (FSG) layer onto the substrate using the plasma;

(d) terminating the silane flow during deposition of a topmost portion of the FSG layer; and

(e) depositing a barrier layer on the topmost portion of the FSG layer.

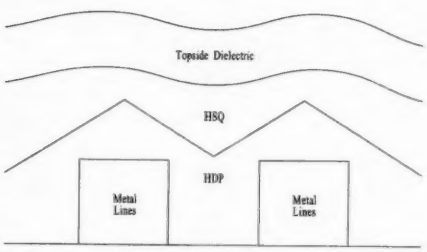
US 6,410,458 B1
METHOD AND SYSTEM FOR ELIMINATING VOIDS IN A SEMICONDUCTOR DEVICE

Lu You, Santa Clara; Dawn Hopper, and John Jianshi Wang, both of San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Provisional application No. 60/168,142, filed on Nov. 29, 1999. This application Jan. 31, 2000, Appl. No. 494,755.

Int. Cl. H01L *23/48*

U.S. Cl. 438—782 **8 Claims**



8. A method for depositing insulating layers over spaced metal lines on a semiconductor device, comprising the steps of:

a) forming spaced metal lines over a semiconductor substrate, wherein the spaced metal lines are separated by spacer gaps;

b) filling the spacer gaps between the spaced metal lines with a first oxide layer utilizing a high density plasma deposition technique;

c) annealing the semiconductor device with H2N2 at a temperature of at least 400° C. immediately after step b);

d) forming a second oxide layer over the first oxide layer utilizing a hydrogen silsesquioxane resin, wherein the second oxide layer provides a planarized surface; and

e) forming a topside dielectric layer of silicon nitride over the second oxide layer.

US 6,410,459 B2

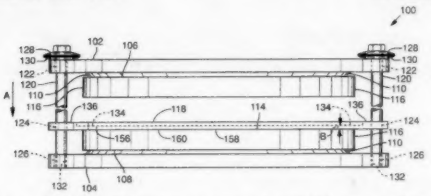
WAFER PLANARIZATION USING A UNIFORM LAYER OF MATERIAL AND METHOD AND APPARATUS FOR FORMING UNIFORM LAYER OF MATERIAL USED IN SEMICONDUCTOR PROCESSING

Guy T. Blalock; Hugh E. Stroupe, and Brian F. Gordon, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Division of application No. 09/389,644, filed on Sep. 2, 1999. This application Aug. 14, 2001, Appl. No. 930,022.

Int. Cl. H01L *21/31;21/469*

U.S. Cl. 438—782 **16 Claims**



1. A method of forming a layer of material on a substrate assembly comprising:

introducing material for forming the layer into an open central region of a stop;

disposing the stop at least partially between first and second flat pressing surfaces;

pressing the material between the first and second flat pressing surfaces, wherein the stop is configured to limit the extent to which the first and second flat pressing surfaces approach one another during pressing to thereby form a layer of material having a substantially uniform thickness; and

applying the layer of material to a surface of the substrate assembly.

US 6,410,460 B1

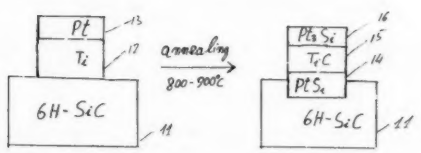
TECHNOLOGY FOR THERMODYNAMICALLY STABLE CONTACTS FOR BINARY WIDE BAND GAP SEMICONDUCTORS

Ilan Shalish, Givatayim; Yoram Shapira, Even-Yehuda, and Moshe Eizenberg, Haifa, all of Israel, assignors to Ramot University Authority for Applied Research and Industrial Development Ltd., Tel Aviv, and Technion Research and Development Foundation Ltd., Haifa, both of Israel

Filed May 15, 2000, Appl. No. 570,812

Int. Cl. H01L *21/31;21/469;21/44*

U.S. Cl. 438—785 **13 Claims**



1. A method for preparing a contact for a binary substrate that includes a first element A and a second element D, D being less metallic then A, comprising the steps of:

(a) depositing a layer of a metal Z on the substrate;

(b) depositing of a layer of a metal X on top of said layer of metal Z and

(c) annealing the substrate with said deposited layers of metal X and of metal Z at a sufficiently high temperature for a sufficient length of time, to allow A and D of the substrate to react with said metal X and with said metal Z to yield a first layer, in contact with the substrate, of a binary compound of A and X, and a second layer, in contact with said first layer, of a binary compound of D and Z.

US 6,410,461 B1

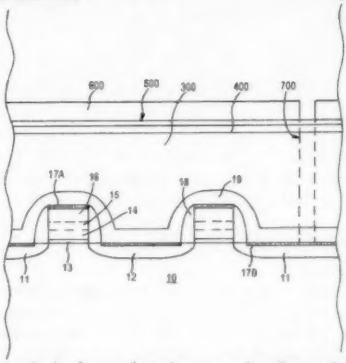
METHOD OF DEPOSITING SION WITH REDUCED DEFECTS

Pei-Yuan Gao, San Jose, and Minh Van Ngo, Fremont, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 7, 2001, Appl. No. 849,357

Int. Cl. H01L *21/469*

U.S. Cl. 438—786 **10 Claims**



1. A method of manufacturing a semiconductor device, the method comprising depositing a layer of silicon oxynitride, over a substrate by:

(a): flowing silane (SiH_4), nitrous oxide (N_2O) and nitrogen (N_2);

(b): initiating deposition of silicon oxynitride at a first power while flowing SiH_4, N_2O and N_2;

(c): ramping down by reducing the first power to a second power, discontinuing the flow of SiH_4, and continuing the flow of N_2O and N_2; and

(d): discontinuing the power and flow of N_2O and N_2.

US 6,410,462 B1

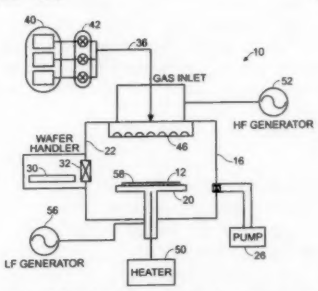
METHOD OF MAKING LOW-K CARBON DOPED SILICON OXIDE

Hongning Yang, Vancouver, Wash.; David Russell Evans, Beaverton, Oreg., and Sheng Teng Hsu, Camas, Wash., assignors to Sharp Laboratories of America, Inc., Camas, Wash.

Filed May 12, 2000, Appl. No. 569,861

Int. Cl. H01L *21/31;23/58*

U.S. Cl. 438—788 **30 Claims**



1. A method of forming a low dielectric constant carbonaceous silicon oxide on a substrate for use in interconnect structures of integrated circuits comprising the steps of:

a) positioning a substrate within a plasma enhanced chemical vapor deposition (PECVD) chamber;

b) introducing a source of silicon, a source of oxygen, and a source of carbon into the plasma enhanced chemical vapor deposition (PECVD) chamber containing the substrate;

c) applying sufficient energy within the plasma enhanced chemical vapor deposition (PECVD) chamber to form plasmas of silicon containing free radicals, oxygen containing free radicals, and carbon containing free radicals within the plasma enhanced chemical vapor deposition (PECVD) chamber; and

d) forming the low dielectric constant carbonaceous silicon oxide on the substrate within the deposition chamber, wherein the low dielectric constant carbonaceous silicon oxide has a dielectric constant of less than 4.

US 6,410,463 B1

METHOD FOR FORMING FILM WITH LOW DIELECTRIC CONSTANT ON SEMICONDUCTOR SUBSTRATE

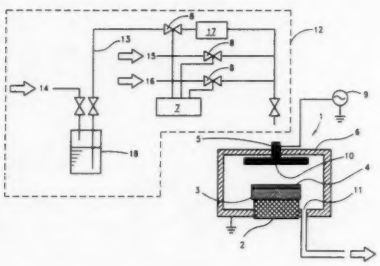
Nobuo Matsuki, Tama, Japan, assignor to ASM Japan K.K., Tokyo, Japan

Continuation of application No. 09/326,848, filed on Jun. 7, 1999, and a continuation of application No. 09/326,847, filed on Jun. 7, 1999, now Pat. No. 6,352,945, and a continuation-in-part of application No. 09/243,156, filed on Feb. 2, 1999, now abandoned. This application Oct. 18, 2000, Appl. No. 691,079.

Claims priority, application Japan, Feb. 5, 1998, 10-37929

Int. Cl. H01L *21/31*

U.S. Cl. 438—790 **10 Claims**



1. In a method for forming in a reactor a film having a low relative dielectric constant on a semiconductor substrate by plasma reaction, wherein the improvement comprises reducing a relative dielectric constant of the film by lengthening a residence time, Rt, of the reaction gas in the reactor, wherein 100 msec≦Rt,

$$Rt[s]=9.42\times10^{7}(Pr\cdot Ts/Ps\cdot Tr)r_w^{2}d/F$$

wherein:

Pr: reaction chamber pressure (Pa)

Ps: standard atmospheric pressure (Pa)

Tr: average temperature of the reaction gas (K)

Ts: standard temperature (K)

r_w: radius of the silicon substrate (m)

d: space between the silicon substrate and the upper electrode (m)

F: total flow volume of the reaction gas (sccm).

US 6,410,464 B1

HAND-TEARABLE TAPE

Robert H. Menzies, and Robert J. Maki, both of Hudson, Wis., assignors to 3M Innovative Properties Company, St. Paul, Minn.

Filed Oct. 2, 1998, Appl. No. 166,206

Int. Cl. B32B *5/08;5/26;* **D04H** *13/00;* **C09J** *7/04*

U.S. Cl. 442—151 **42 Claims**

1. A medical article comprising a laminate composite that is porous and finger-tearable in the machine direction and the cross direction, comprising:

(a) a nonwoven fiber web layer;

(b) a scrim layer adjacent to the nonwoven web layer comprising spaced-apart filaments oriented substantially in the machine direction that are substantially perpendicular to spaced-apart filaments oriented substantially in the cross direction; wherein the scrim has in the range of about 5–30 filaments/2.5-cm in the machine direction and in the range of about 5–30 filaments/2.5-cm in the cross direction; and

(c) a binder material coated through both the nonwoven fiber web layer and the scrim layer.

9. A medical adhesive tape that is porous and finger-tearable in the machine direction and the cross direction, comprising:

(a) a nonwoven fiber web layer;

(b) a scrim layer adjacent to the nonwoven web layer comprising spaced-apart filaments oriented substantially in the machine direction that are substantially perpendicular to spaced-apart filaments oriented substantially in the cross direction; wherein the scrim has in the range of about 5–30 filaments/2.5-cm in the machine direction and in the range of about 5–30 filaments/2.5-cm in the cross direction;

(c) a binder material coated through both the nonwoven fiber web layer and the scrim layer; and

(d) an adhesive layer adjacent to the scrim layer.

US 6,410,465 B1

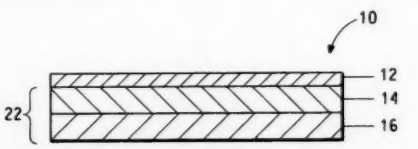
COMPOSITE SHEET MATERIAL

Hyun Sung Lim, Midlothian, Va., and George Joseph Ostapchenko, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Provisional application No. 60/137,506, filed on Jun. 2, 1999. This application Oct. 19, 1999, Appl. No. 421,135.

Int. Cl. B32B *5/26;27/12;27/02*

U.S. Cl. 442—389 **18 Claims**



1. A moisture vapor permeable, substantially liquid impermeable composite sheet material comprising:

a first fibrous nonwoven web having a first side and an opposite second side,

a second fibrous nonwoven web having a first side and an opposite second side, the first side of said second fibrous nonwoven web abutting the second side of said first fibrous nonwoven web,

said first and second fibrous nonwoven webs each being powder-bonded webs wherein the fibers of said first and second fibrous webs are bonded to the other fibers of such respective webs by a synthetic adhesive permeating said first and second nonwoven fibrous webs, and wherein the first and second fibrous nonwoven webs are bonded to each other by said adhesive,

a moisture vapor permeable thermoplastic film bonded to the second side of said second fibrous nonwoven web;

wherein

at least 90 weight percent of the fibers in said first fibrous nonwoven web are compatible with said adhesive,

between 25 and 75 weight percent of the fibers in said second fibrous nonwoven web are compatible with said adhesive and said thermoplastic film,

between 75 and 25 weight percent of the fibers in said second fibrous nonwoven web are incompatible with said adhesive and said thermoplastic film, and

at least 50 weight percent of the polymer in said thermoplastic film is compatible with said adhesive.

US 6,410,466 B1

GLASS-CERAMICS FOR A LIGHT FILTER

Naoyuki Goto, Machida; Mariko Kataoka, Sagamihara, both of Japan, and Donald G. Polensky, Morgan Hill, Calif., assignors to Kabushiki Kaisha Ohara, Kanagawa-ken, Japan

Filed Apr. 17, 2000, Appl. No. 551,043

Claims priority, application Japan, Aug. 10, 1999, 11-226947

This patent is subject to a terminal disclaimer.

Int. Cl. C03C *10/04;10/14*

U.S. Cl. 501—5 **4 Claims**

1. Glass-ceramics for a light filter having a coefficient of thermal expansion within a range from 95×10^{-7}/C. to 140×10^{-7}/C. within a temperature range from −20 C. to +70 C., having light transmittance for plate thickness of 10 mm which is 60% or over within a wavelength range from 950 nm to 1600 nm, containing, as predominant crystal phases,

(a) lithium disilicate, and

(b) at least one selected from the group consisting of α-quartz, α-quartz solid solution, α-cristobalite and α-cristobalite solid solution, and having a composition which consists essentially in weight percent of:

SiO_2	70–77%
Li_2O	8–12%
K_2O	0.5–3%
MgO + ZnO + SrO + BaO	1–5%
P_2O_5	1.5–3%
ZrO_2	2–7%
Al_2O_3	3–9%
$Sb_2O_3 + As_2O_3$	0–2%.

US 6,410,467 B1

ANTIMONY OXIDE GLASS WITH OPTICAL ACTIVITY

James E. Dickinson; Adam J G Ellison, both of Corning, N.Y.; Alexandre M. Mayolet, Chartres, and Michel Prassas, Vulaines S/Seine, both of France, assignors to Corning Incorporated, Corning, N.Y.

Provisional application No. 60/081,073, filed on Apr. 8, 1998.

This application Apr. 8, 1999, Appl. No. 288,454.

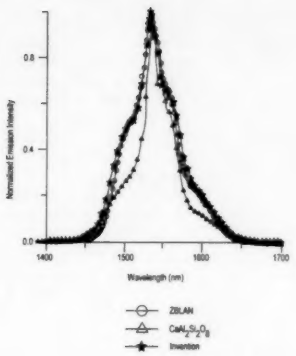
This patent is subject to a terminal disclaimer.

Int. Cl. C03C *3/04;4/12;3/12;3/23;13/04*

U.S. Cl. 501—37 **43 Claims**

1. An optically active glass (in mole % on an oxide basis), comprising:

at least 5% of Sb_2O_3; and



0% <RE_2O_3<4%, where RE is a rare earth element, or scandium.

US 6,410,468 B2

SI3N4 CERAMIC, SI-BASE COMPOSITION FOR PRODUCTION THEREOF AND PROCESSES FOR PRODUCING THESE

Seiji Nakahata, and Akira Yamakawa, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Division of application No. 08/708,933, filed on Sep. 6, 1996, now Pat. No. 6,284,690. This application Jul. 5, 2001, Appl. No. 899,736.

Claims priority, application Japan, Nov. 16, 1995, 7-298004

This patent is subject to a terminal disclaimer.

Int. Cl. C04B *35/591*

U.S. Cl. 501—97.1 **9 Claims**

1. An Si_3N_4 ceramic produced from a slurry Si-base composition, said ceramic having a relative density of at least 96% and a flexural strength of at least 800 MPa, wherein said slurry Si-base composition comprises Si powder having a thickness of a surface oxide film ranging from 1.5 to 15 nm, 50 to 90% by weight of water, 0.2 to 7.5% by weight, in terms of oxide, of a sintering aid and 0.05 to 3% by weight of a dispersant and has a pH value adjusted to 8–12.

US 6,410,469 B1

SLAGLINE SLEEVE FOR SUBMERGED ENTRY NOZZLE AND COMPOSITION THEREFOR

Donald B. Hoover; Franklin A. Renda; Donald J. Griffin, all of York, Pa., and Colin Richmond, N. Yorkshire, United Kingdom, assignors to Baker Refractories, Inc., York, Pa.

PCT No. PCT/US97/11179, § 371 Date Aug. 11, 1999, § 102(e) Date Aug. 11, 1999, PCT Pub. No. WO98/03444, PCT Pub. Date Jan. 29, 1998

Provisional application No. 60/021,406, filed on Jul. 9, 1996.

This PCT application Jul. 8, 1997, Appl. No. 147,487.

Int. Cl. C04B *35/52;35/482*

U.S. Cl. 501—101 **13 Claims**

1. A composition for forming a slagline sleeve which comprises 80–90 parts by weight of zirconium oxide partially stabilized with CaO or MgO in the crystalline structure thereof, 10–20 parts by weight of graphite, 5–10 parts by weight of antioxidant, 10–20 parts by weight of phenolic resin solution containing 40–60% by weight of phenolic resin dissolved therein, and about 5 parts by weight of doloma; whereby said doloma counteracts contractile forces which develop when water is released as said resin is cured to form resite; said doloma being separate and distinct from said CaO or MgO in the crystalline structure of said zirconium oxide.

US 6,410,470 B1

THERMAL SPRAY POWDER PROCESS

Howard Wallar, Worcester; Robert F. Quinlivan, Rutland, and Sung H. Yu, Worcester, all of Mass., assignors to Saint-Gobain Industrial Ceramics, Inc., Worcester, Mass.

Filed Apr. 24, 2000, Appl. No. 556,324

Int. Cl. C04B *35/12*

U.S. Cl. 501—126 **13 Claims**

1. A process for the production of a chromium oxide thermal spray powder which comprises calcining a ceramic powder with a particle size of less than 125 microns and comprising at least 5% by volume of chromium oxide particles smaller than 5 microns said calcining continuing for a time sufficient to reduce the volume of particles with sizes less than 5 microns to below 5%.

US 6,410,471 B2

METHOD FOR PREPARATION OF SINTERED BODY OF RARE EARTH OXIDE

Masami Kaneyoshi, Fukui-ken, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 15, 2001, Appl. No. 783,602

Claims priority, application Japan, Mar. 7, 2000, 2000-062361

Int. Cl. C04B *35/50;* **B29C** *43/00;67/24;67/04*

U.S. Cl. 501—152 **17 Claims**

1. A method for the preparation of a sintered body of a rare earth oxide which comprises the steps of:

(a) shaping a powder of the rare earth oxide, of which the D_{50} value of the particle diameter distribution does not exceed 2.0 μm, the D_{90} value of the particle diameter distribution does not exceed 3.0 μm and the specific surface area is in the range from 5 to 20 m^2/g, into a powder compact; and

(b) subjecting the powder compact to a heat treatment for sintering at a sintering temperature of 1000° C. or higher for at least 1 hour, in which the rate of temperature elevation in the range from 500° C. to the sintering temperature does not exceed 500° C. per hour and the rate of temperature decrease from the sintering temperature does not exceed 600° C. per hour.

US 6,410,472 B2

CATALYTIC REFORMING CATALYST ACTIVATION

Donald H. Macahan, Borger, Tex., and Fan-Nan Lin, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of application No. 09/343,376, filed on Jun. 30, 1999, now Pat. No. 6,291,381. This application Jul. 31, 2001, Appl. No. 919,453.

Int. Cl. B01J *20/34;23/00;23/40;23/56;23/44*

U.S. Cl. 502—38 **13 Claims**

1. A process for regenerating a deactivated reforming catalyst contained in a multiple reaction zone system and which has become deactivated through employment in the reforming of a hydrocarbon, said process comprises: (a) purging said multiple reaction zone system with an inert gas; (b) subjecting said deactivated reforming catalyst to an oxidative burning off at a temperature and for a period of time sufficient to remove substantially all carbonaceous deposits thereon thereby providing a substantially carbon free catalyst; (c) subjecting said substantially carbon free catalyst to an oxygen treatment with a gas containing molecular oxygen at a temperature and for a time sufficient to effect the oxidation of the metals contained in said substantially carbon free catalyst thereby providing an oxidized catalyst; (d) purging said oxidized catalyst of molecular oxygen thereby providing a purged catalyst; (e) cooling said purged catalyst thereby providing a cooled catalyst; (f) reducing said cooled catalyst with hydrogen, said hydrogen being introduced into a reaction zone of said multiple reaction zone system; and (g) simultaneously with step (f) contacting said cooled catalyst with a chlorine-containing compound by introducing said chlorine-containing compound serially into each reaction zone of said multiple reaction zone system under conditions to effect decomposition of said chlorine-containing compound thereby providing a chlorine-treated catalyst.

US 6,410,473 B1

QUASI CRYSTALLINE INORGANIC OXIDE COMPOSITIONS PREPARED BY NEUTRAL TEMPLATING ROUTE

Thomas J. Pinnavaia; Wenzhong Zhang, both of East Lansing; Thomas R. Pauly, Lansing, all of Mich., and Peter T. Tanev, Katy, Tex., assignors to Board of Trustees of Michigan State University, East Lansing, Mich.

Division of application No. 09/192,172, filed on Nov. 13, 1998, which is a continuation-in-part of application No. 08/355,979, filed on Dec. 14, 1994, now Pat. No. 5,840,264, which is a continuation-in-part of application No. 08/293,806, filed on Aug. 22, 1994, now abandoned, and a continuation-in-part of application No. 08/527,504, filed on Sep. 13, 1995, now Pat. No. 5,672,556. This application Apr. 3, 2000, Appl. No. 541,728.

This patent is subject to a terminal disclaimer.

Int. Cl. C01B *33/38*

U.S. Cl. 502—74 **16 Claims**

1. A quasi crystalline inorganic oxide composition having framework-confined mesopores prepared by a method which comprises reacting a neutral amine template and a neutral inorganic oxide precursor wherein the template is dissolved in a solution of water and a miscible organic solvent, containing a larger volume of either the miscible organic solvent or the water, aging of the precipitate and removal of at least some of the template and the aqueous solution to form the quasi crystalline composition which has regular wormhole shaped channels.

US 6,410,474 B1

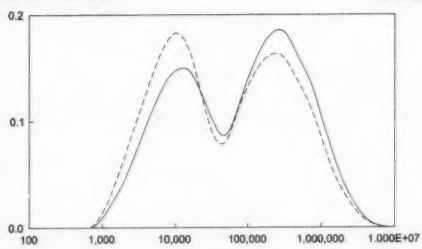
PROCESS FOR CONTROLLING THE MWD OF A BROAD/BIMODAL RESIN IN A SINGLE REACTOR

Thomas E. Nowlin, West Windsor; Sandra D. Schregenberger, Neshanic; Pradeep P. Shirodkar, Somerset, and Grace O. Tsien, Colonia, all of N.J., assignors to ExxonMobil Oil Corporation, Fairfax, Va.

Continuation of application No. 08/303,269, filed on Sep. 8, 1994, now abandoned. This application Mar. 10, 1997, Appl. No. 814,526.

Int. Cl. B01J *31/00;37/00;* **C08F** *4/02;4/60*

U.S. Cl. 502—113 **47 Claims**



1. A mixed catalyst composition comprising I) and II), wherein the mixed catalyst composition comprises greater than 50 weight percent of I), wherein

I) comprises a supported catalyst of at least two different transition metal compositions, each composition providing under identical olefin polymerization conditions, a different polymerization.product to provide a resin comprising two different molecular weight distribution fractions, wherein one of said at least two different transition metal compositions is a metallocene compound of a metal selected from the group consisting of zirconium, hafnium and titanium, and wherein

II) comprises a support matrix and, supported thereon, one of said at least two different transition metal compositions, which is effective to increase one fraction of said two different molecular weight distribution fractions.

US 6,410,475 B1

CATALYST INTENDED FOR THE POLYMERIZATION OF OLEFINS, PROCESS FOR ITS MANUFACTURE AND USE

Charles Detrez, Brussels, and Benoit Koch, Hannut, both of Belgium, assignors to Solvay Polyolefins Europe-Belgium (Societe Anonyme), Brussels, Belgium

Filed Oct. 5, 1999, Appl. No. 412,594

Claims priority, application Belgium, Oct. 5, 1998, 09800719

Int. Cl. B01J *31/00;37/00;* **C08F** *4/02;4/60*

U.S. Cl. 502—118 **11 Claims**

1. A solid catalytic composition, comprising a transition metal selected from the group consisting of Group 4B and 5B metals of the Periodic Table; magnesium and halogen, deposited on an inorganic support, characterized in that the inorganic support comprises aluminum phosphate (A) and at least one inorganic oxide (B) selected from the group consisting of silica and alumina.

US 6,410,476 B1

POLYOLEFIN PRODUCTION

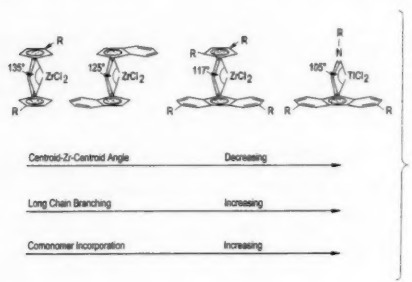
Abbas Razavi, Mons, and Liliane Peters, Marbais, both of Belgium, assignors to Fina Research, S.A., Feluy, Belgium

Filed Jul. 2, 1999, Appl. No. 346,881

Claims priority, application European Pat. Off., Jul. 2, 1998, 98112233

Int. Cl. B01J *31/38;* **C08F** *4/16*

U.S. Cl. 502—152 **8 Claims**



1. A catalyst system comprising a metallocene catalyst component of general formula $R"(CpR_m)(Cp'R'_n)MQ_2$ supported on an inert support, wherein Cp is a cyclopentadienyl moiety, Cp' is a substituted fluorenyl ring, R" is a structural bridge imparting stereorigidity to the component; each R is independently hydrogen or a hydrocarbyl having 1 to 20 carbon atoms in which $0 \leqq m \leqq 4$; each R' is independently $—SiR'"_3$ in which each R'" is independently hydrogen or a hydrocarbyl having 1 to 20 carbon atoms, and in which $0 < n \leqq 8$;M is a Group IVB transition metal or vanadium; and each Q is hydrocarbyl having 1 to 20 atoms or halogen; the metallocene having a centroid-M-centoid angle in the range from 105° to 125°.

US 6,410,477 B1

HYDROGENATION CATALYST OF CARBON MONOXIDE AND METHOD OF MANUFACTURING HYDROGENATION PRODUCT

Yasuo Ohtsuka; Muneyoshi Yamada, and Ye Wang, all of Sendai, Japan, assignors to President of Tohoku University, Sendai, Japan

Filed Sep. 8, 2000, Appl. No. 657,905

Claims priority, application Japan, Mar. 9, 2000, 2000-064874

Int. Cl. B01J *21/08;21/12;21/14;* **C07C** *27/00;* **C07B** *63/02*

U.S. Cl. 502—240 **9 Claims**

1. A catalyst for obtaining gasoline fuel oil components or diesel oil components by hydrogenation of carbon monoxide, comprising:

a transition metal; and

a porous material carrying said transition metal,

wherein said porous material consists primarily of silica, and

said porous material has pores. 90% more of which are fine pores each halving a diameter of 1 to 50 nm.

US 6,410,478 B1

REVERSIBLE THERMOSENSITIVE RECORDING MEDIUM

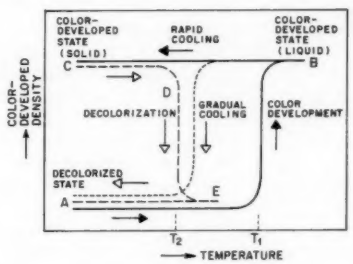
Masafumi Torii, Shizuoka; Hiroaki Matsui, Shizuoka, and Masaru Shimada, deceased, late of Shizuoka, all of Japan, by Mitsuko Shimada, legal representative, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 5, 2000, Appl. No. 655,505

Claims priority, application Japan, Sep. 6, 1999, 11-251378

Int. Cl. B41M *5/30*

U.S. Cl. 503—201 **19 Claims**

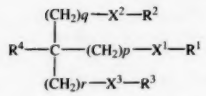


17. An image display method for displaying an image on a reversible thermosensitive recording medium, comprising the step of forming an image corresponding to output information in said reversible thermosensitive recording medium using a printer comprising means for imagewise heating said recording medium, said reversible thermosensitive recording medium comprising a support, and a reversible thermosensitive recording layer formed thereon comprising:

a reversible thermosensitive coloring composition comprising an electron-donating coloring compound and an electron-accepting compound, which composition is capable of inducing color formation in said electron-donating coloring compound, capable of reversibly assuming a color-developed state or a decolorized state, depending upon the temperature of said reversible thermosensitive coloring composition when heated, and/or the cooling rate of said reversible thermosensitive coloring composition when cooled after the heating thereof, and

a decolorization accelerating agent represented by formula (I):

(I)



wherein p is an integer of 0 to 3; q and r are each independently an integer of 1 to 3; X^1, X^2, and X^3 are each a bivalent hetero-atom-containing group; R^1, R^2, and R^3 are each a hydrocarbon group having 1 to 22 carbon atoms, provided that at least one of R^1, R^2, or R^3 is an aliphatic hydrocarbon group having 8 or more carbon atoms; and R^4 is a hydrogen atom, hydroxyl group, or an aliphatic hydrocarbon group having 1 to 8 carbon atoms.

US 6,410,479 B1

THERMALLY SENSITIVE RECORDING MEDIUM

Tadakazu Fukuchi; Kaoru Hamada; Daisuke Imai; Hidenori Ogawa; Yuji Tsuzuki; Reiko Sato, and Yoshihide Kimura, all of Shinjuku-ku, Japan, assignors to Nippon Paper Industries Co Ltd, Tokyo, Japan

Filed Oct. 28, 1999, Appl. No. 428,489

Claims priority, application Japan, Oct. 29, 1998, 10-307972; Mar. 10, 1999, 11-063118; Sep. 2, 1999, 11-248554

Int. Cl. B41M *5/40*

U.S. Cl. 503—226 **12 Claims**

1. A thermally sensitive recording medium comprising

a substrate,

a thermally sensitive recording medium supported on said substrate, and

a glossing layer on said thermally sensitive recording layer,

wherein said glossing layer comprises an inorganic pigment and a fixing composition, wherein the surface glossiness of the glossing layer, measured according to for light at an angle of incidence and angle of reflection of 75°, is greater than 50%, wherein said inorganic pigment is at least one pigment selected from the group consisting of colloidal silica, barium sulfate, titanium oxide and aluminum hydroxide, wherein the inorganic pigment and fixing composition have an average particle size not larger than 0.3 μm, and wherein the amount of fixing composition having an average particle size of more than 0.3 μm is not more than 0.03 parts by weight per part by weight of particles having an average particle size not larger than 0.3 μm and further wherein said fixing composition does not cause sticking at a temperature higher than 200° C., as determined under the following conditions:

(1) the fixing composition is coated at a rate of 20 g/cm^2, on paper having a density of 60 g/cm^2 and a thickness of 74 μm, and heated for 5 minutes at a temperature of 110° C., such that the coating layer of the fixing composition is completely hardened;

(2) the obtained coated paper is cut to a size of 4 cm×8 cm and doubled up with the coated surface contacting itself, to form a sample specimen of 4 cm×4 cm;

(3) the specimen is placed on a hot plate heated to 200° C.;

(4) a weight of 500 g (whose base diameter is 4 cm) is placed on the specimen for 5 seconds, after which the specimen is cooled down to room temperature, and the folded specimen is unfolded easily without sticking.

US 6,410,480 B1

HERBICIDALLY ACTIVE 3-HYDROXY-4-ARYL-5-OXOPYRAZOLINE DERIVATIVES

Michel Mühlebach, Binningen; Jutta Glock, Mumpf; Thomas Maetzke, Münchenstein, all of Switzerland, and André Stoller, Blotzheim, France, assignors to Syngenta Crop Protection, Inc., Greensboro, N.C.

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PCT Filed Mar. 11, 1999, Appl. No. 646,142

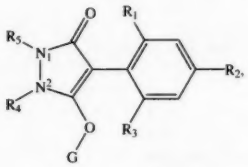
Claims priority, application Switzerland, Mar. 13, 1998, 616/98; Dec. 8, 1998, 2431/98

Int. Cl. A01N *43/90;* **C07D** *498/04*

U.S. Cl. 504—105 **18 Claims**

1. A compound of the formula I

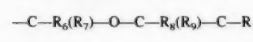
(I)



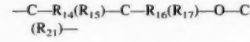
in which

R_1, R_2 and R_3 independently of one another are halogen, nitro, cyano, C_1–C_4alkyl, C_2–C_4alkenyl, C_2–C_4alkynyl, C_1–C_4haloalkyl, C_2–C_6haloalkenyl, C_3–C_6cycloalkyl, halogen-substituted C_3–C_6cycloalkyl, C_1–C_6alkoxyalkyl, C_1–C_6alkylthioalkyl, hydroxyl, mercapto, C_1–C_6alkoxy, C_3–C_6alkenyloxy, C_3–C_6alkynyloxy, C_1–C_4alkylcarbonyl, C_1–C_4alkoxycarbonyl, C_1–C_4alkylthio, C_1–C_4alkylsulfinyl, C_1–C_4alkylsulfonyl, amino, C_1–C_4alkylamino or di(C_1–C_4alkyl)amino;

R_4 and R_5 together are a group



(Z$_1$),



(Z$_2$),

or

(Z$_3$);

in which

R_6, R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, R_{14}, R_{15}, R_{16}, R_{17}, R_{18}, R_{19}, R_{20}, R_{21}, R_{22}, R_{23}, R_{24}, R_{25}, R_{26}, R_{27}, R_{28}, and R_{29} independently of one another are hydrogen, halogen, C_1–C_4alkyl or C_1–C_4haloalkyl where an alkylene ring, which together with the carbon atoms of the groups Z_1, Z_2 or Z_3 contains 2 to 6 carbon atoms and may be interrupted by oxygen, may either be fused or spiro-linked to the carbon atoms of the groups Z_1, Z_2 or Z_3, or where this alkylene ring bridges at least one ring atom of the groups Z_1, Z_2 or Z_3;

G is hydrogen, —C(X_1)—R_{30}, —C(X_2)—X_3—R_{31}, —C(X_4)—N(R_{32})—R_{33}, —SO_2—R_{34}, an alkali metal, alkaline earth metal, sulfonium or ammonium cation or —P(X_5)(R_{35})—R_{36};

X_1, X_2, X_3, X_4 and X_5 independently of one another are oxygen or sulfur; and

R_{30}, R_{31}, R_{32}, R_{33}, R_{34}, R_{35} and R_{36} independently of one another are hydrogen, C_1–C_5alkyl, C_1–C_5haloalkyl, C_2–C_5alkenyl, C_1–C_5alkoxyalkyl, C_3–C_6cycloalkyl or phenyl, and R_{34} is additionally C_2–C_{20}alkenyl, C_2–C_{20}alkenyl substituted by halogen, alkylcarbonyl, alkoxycarbonyl, alkylcarbonyloxy, alkoxy, thioalkyl, alkylthiocarbonyl, alkylcarbonylthio, alkylsulfonyl, alkylsulfoxyl, alkylaminosulfonyl, dialkylaminosulfonyl, alkylsulfonyloxy, alkylsulfonylamino,

alkylamino, dialkylamino, alkylcarbonylamino, dialkylcarbonylamino, alkyl-alkylcarbonylamino, cyano, $(C_3–C_7)$cycloalkyl, $(C_3–C_7)$heterocyclyl, trialkylsilyl, trialkylsilyloxy, phenyl, substituted phenyl, heteroaryl or substituted heteroaryl, $C_2–C_{20}$alkynyl, $C_2–C_{20}$alkynyl substituted by halogen, alkylcarbonyl, alkoxycarbonyl, alkylcarbonyloxy, alkoxy, thioalkyl, alkylthiocarbonyl, alkylcarbonylthio, alkylsulfonyl, alkylsulfoxyl, alkylaminosulfonyl, dialkylaminosulfonyl, alkylsulfonyloxy, alkylsulfonylamino, alkylamino, dialkylamino, alkylcarbonylamino, dialkylcarbonylamino, alkyl-alkylcarbonylamino, cyano, $(C_3–C_7)$cycloalkyl, $(C_3–C_7)$heterocyclyl, trialkylsilyl, trialkylsilyloxy, phenyl, substituted phenyl, heteroaryl or substituted heteroaryl, $(C_1–C_7)$cycloalkyl, $(C_1–C_7)$cycloalkyl substituted by halogen, haloalkyl, $(C_1–C_6)$alkyl, alkoxy, alkylcarbonyloxy, thioalkyl, alkylcarbonylthio, alkylamino, alkylcarbonylamino, trialkylsilyl or trialkylsilyloxy, heteroaryl, heteroaryl substituted by halogen, haloalkyl, nitro, cyano, $(C_1–C_6)$alkyl, alkoxy, alkylcarbonyloxy, thioalkyl, alkylcarbonylthio, alkylamino, alkylcarbonylamino, trialkylsilyl or trialkylsilyloxy, heteroaryloxy, substituted heteroaryloxy, heteroarylthio, substituted heteroarylthio, heteroarylamino, substituted heteroarylamino, diheteroarylamino, substituted diheteroarylamino, phenylamino, substituted phenylamino, diphenylamino, substituted diphenylamino, cycloalkylamino, substituted cycloalkylamino, dicycloalkylamino, substituted dicycloalkylamino, cycloalkoxy or substituted cycloalkoxy, and salts and diastereomers of the compounds of the formula I.

US 6,410,481 B1

WATER-DISPERSIBLE GRANULES OF SUSPOEMULSIONS

Hans Röchling, Bad Soden am Taunus; Hans Schumacher, Flörsheim am Main, and Joachim Baumgärtner, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main

Continuation of application No. 07/973,982, filed on Nov. 6, 1992, now abandoned. This application May 19, 1995, Appl. No. 445,165.

Claims priority, application Germany, Nov. 8, 1991, 41 36 781

Int. Cl. A01N *25/14;37/12;37/34;43/24;47/30*

U.S. Cl. 504—144 **6 Claims**

1. Water-dispersible granules of suspoemulsions consisting essentially of

10 to 90% by weight of one or more pesticidally active substance as the main component, said active substance having a melting point of more than 65° C., which can be formulated in the form of an aqueous dispersion,

0.1 to 20% by weight of one or more liquid pesticidally active substance or a pesticidally active substance having a melting point below 65° C. and/or which is not sufficiently active in the solid state, in dissolved form,

0.2 to 20% by weight of a solvent or solvent mixture with a boiling point above 170° C.,

1 to 12% by weight of one or more wetting agents,

2 to 15% by weight of one or more dispersants,

0.2 to 5% by weight of one or more adhesives,

0.5 to 80% by weight of inert substance and

0.5 to 10% by weight of one or more emulsifiers.

US 6,410,482 B1

(HET) ARYLSULFONYLUREAS HAVING AN AMINO FUNCTION, THEIR PRESENTATION AND THEIR USE AS HERBICIDES AND PLANT GROWTH REGULATORS

Gerhard Schnabel, Grosswallstadt; Lothar Willms, Hofheim; Klaus Bauer, Hanau; Hermann Bieringer, Eppstein, and Christopher Rosinger, Hofheim, all of Germany, assignors to Hoechst Schering AgrEvo GmbH, Berlin, Germany

Filed May 13, 1997, Appl. No. 855,251

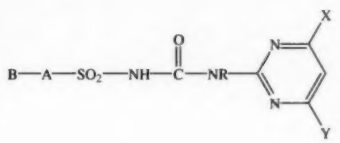
Claims priority, application Germany, May 15, 1996, 196 19 628

Int. Cl. C07D *401/12;403/12;* **A01N** *43/54*

U.S. Cl. 504—214 **8 Claims**

1. A compound of the formula (I) or a salt thereof

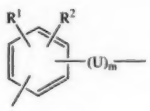
(I)



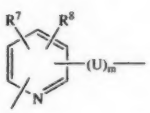
wherein

A is a bridge of the formulae $A_1–A_9$

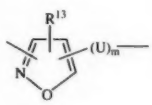
A1



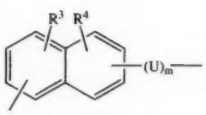
A2



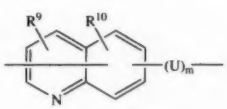
A3



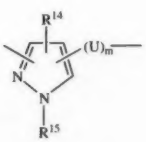
A4



A5



A6



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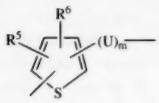
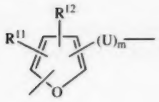
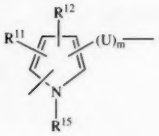
A7



A8



A9

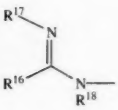


m is 0 or 1,

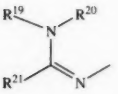
U is CH_2, O or NH or $(C_1–C_3$-alkyl)N,

B is a group of the formula B1 to B5,

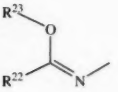
B1



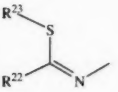
B2



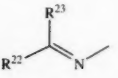
B3



B4



B5



R is hydrogen, $C_1–C_5$-alkyl, $C_1–C_5$-haloalkyl, $C_2–C_5$-alkenyl, $C_2–C_5$-haloalkenyl, $C_2–C_5$-alkynyl or $C_2–C_5$-haloalkynyl,

R^1 is H, CN, halogen, azide, NO_2, OH, $C_1–C_8$-alkyl, $C_2–C_8$-alkenyl, $C_2–C_8$-alkynyl, $C_1–C_8$-alkoxy, $C_2–C_8$-alkenyloxy, $C_2–C_8$-alkynyloxy, $C_1–C_8$-alkylthio, $C_2–C_8$-alkenylthio, $C_2–C_8$-alkynylthio, $C_1–C_8$-alkylsulfinyl, $C_2–C_8$-alkenylsulfinyl, $C_2–C_8$-alkynylsulfinyl, $C_1–C_8$-alkylsulfonyl, $C_2–C_8$-alkenylsulfonyl, $C_2–C_8$-alkynylsulfonyl, $C_3–C_8$-cycloalkyl, $C_3–C_8$-cycloalkyloxy, $C_3–C_8$-cycloalkylthio, $C_3–C_8$-cycloalkylsulfinyl, $C_3–C_8$-cycloalkylsulfonyl, $C_5–C_8$-cycloalkenyl, $C_5–C_8$-cycloalkenyloxy, $C_5–C_8$-cycloalkenylthio, $C_5–C_8$-cycloalkenylsulfinyl or $C_5–C_8$-cycloalkenylsulfonyl, each of the last 25 radicals being unsubstituted or substituted by one or more radicals from the group consisting of halogen, $C_1–C_4$-alkoxy, $C_1–C_4$-haloalkoxy, $C_1–C_4$-alkylthio, $C_1–C_4$-haloalkylthio, OH, CN, NO_2, oxo, $C_1–C_4$-alkylsulfonyl, $C_{1–C4}$-haloalkylsulfonyl, $(C_1–C_4$-alkoxy)carbonyl, $(C_1–C_4$-haloalkoxy)-carbonyl, $NR^{32}R^{33}$ and, in the case of cyclic radicals, also $C_1–C_4$-alkyl and $C_1–C_4$-haloalkyl, or is COR^{24}, CSR^{25}, $C(=Nk^{26})R^{27}$, $NR^{28}R^{29}$, SO_2NR^{30} R^{31} or a heterocycle which is unsubstituted or substituted by one or more radicals from the group consisting of halogen, $C_1–C_4$-alkyl, OH, CN, NO_2, CHO, NH_2, mono- and di-$(C_1–C_4$-alkyl)amino, $C_1–C_4$-haloalkyl, $C_1–C_4$-alkoxy, $C_1–C_4$-haloalkoxy, $C_1–C_4$-alkylthio, $C_1–C_4$-haloalkylthio, $C_1–C_4$-alkylcarbonyl, $C_1–C_4$-alkoxycarbonyl and oxo, or is aryl, hetaryl, aryl-$C_1–C_3$-alkyl or hetaryl-$C_1–C_3$-alkyl, the aryl or hetaryl moiety of each of the last 4 radicals being unsubstituted or substituted by one or more radicals from the group consisting of halogen, OH, CN, nitro, $C_1–C_4$-alkyl, $C_1–C_4$-haloalkyl, $C_1–C_4$-alkoxy, $C_1–C_4$-haloalkoxy, $C_1–C_4$-alkylthio, $C_1–C_4$-haloalkylthio, $C_1–C_4$-alkylsulfonyl, $C_1–C_4$-haloalkylsulfonyl, $C_1–C_4$-alkylcarbonyl, $C_1–C_4$-haloalkylcarbonyl, $(C_1–C_4$-alkoxy)carbonyl, $(C_1–C_4$-haloalkoxy)-carbonyl, mono- and di$(C_1–C_4$-alkyl)amino, CHO, NH_2, $CONH_2$, mono- and di-$(C_1–C_4$-alkyl)-aminocarbonyl,

R^2 is hydrogen, $C_1–C_8$-alkyl, $C_2–C_8$-alkenyl, $C_2–C_8$-alkynyl, $C_1–C_8$-alkoxy, $C_2–C_8$-alkenyloxy, $C_2–C_8$-alkynyloxy, $C_1–C_8$-alkylthio, $C_2–C_8$-alkenylthio, $C_2–C_8$-alkynylthio, $C_1–C_8$-alkylsulfonyl, $C_2–C_8$-alkenylsulfonyl, $C_2–C_8$-alkynylsulfonyl, $C_3–C_8$-cycloalkyl, $C_5–C_8$-cycloalkenyl, $C_5–C_8$-cycloalkoxy, $C_5–C_8$-cycloalkenyloxy, $C_3–C_8$-cycloalkylthio, $C_5–C_8$-cycloalkenylthio, $C_3–C_8$-cycloalkylsulfonyl or $C_5–C_8$-cycloalkenylsulfonyl, each of the last 20 radicals being unsubstituted or substituted by one or more radicals from the group consisting of halogen, $C_1–C_4$-alkoxy and $C_1–C_4$-haloalkoxy and, in the case of cyclic radicals, also $C_1–C_4$-alkyl and $C_1–C_4$-haloalkyl, or is halogen, CN, NH_2, mono- or di-$(C_1–C_4$-alkyl)amino,

R^3, R^5, R^7, R^9, R^{11}, R^{13}, and R^{14} are each a radical from the group of the radicals as defined for R^1,

R^4, R^6, R^8, R^{10} and R^{12} are each a radical from the group of the radicals as defined for R^2,

R^{15} is hydrogen, $C_1–C_8$-alkyl, $C_3–C_8$-cycloalkyl, $C_1–C_8$-haloalkyl, $C_3–C_8$-halocycloalkyl, or aryl which is unsubstituted or substituted by one or more radicals from the group consisting of halogen, $C_1–C_4$-alkyl, $C_1–C_4$-haloalkyl; $C_1–C_4$-alkoxy and $C_1–C_4$-haloalkoxy,

R^{16} is NH_2, hydrogen, aryl or hetaryl, each of the last two radicals being unsubstituted or substituted, or $C_1–C_8$-alkyl, $C_2–C_8$-alkenyl, $C_2–C_8$-alkynyl, $C_1–C_8$-alkoxy, $C_2–C_8$-alkenyloxy, $C_2–C_8$-alkynyloxy, $C_1–C_8$-alkylthio, $C_2–C_8$-alkenylthio, $C_2–C_8$-alkynylthio, $C_3–C_8$-cycloalkyl, $C_5–C_8$-cycloalkenyl, $C_3–C_6$-cycloalkoxy, $C_5–C_8$-cycloalkenyloxy, $C_3–C_8$-cycloalkylthio, $C_5–C_8$-cycloalkenylthio, mono-or di-$(C_1–C_6)$alkylamino, each of the last 17 radicals being unsubstituted or substituted, or benzyl, CN, $(C_1–C_6$-alkoxy)carbonyl, $(C_1–C_6$-alkyl)carbonyl, benzyloxycarbonyl or phenylcarbonyl,

R^{17} is OH, NH_2, hydrogen, $C_1–C_8$-alkyl, $C_2–C_8$-alkenyl, $C_2–C_8$-alkynyl, $C_1–C_8$-alkoxy, $C_2–C_8$-alkenyloxy, $C_2–C_8$-alkynyloxy, $(C_1–C_8$-alkyl)carbonyl, $(C_1–C_8$-alkoxy)carbonyl, benzoyl, benzyloxycarbonyl, $(C_1–C_8)$-alkylsulfonyl, arylsulfonyl, $C_3–C_8$-cycloalkyl, $C_5–C_8$-cycloalkenyl, $C_3–C_8$-cycloalkoxy, $C_5–C_8$-cycloalkenyloxy, $C_3–C_8$-cycloalkylcarbonyl, $C_3–C_8$-cycloalkoxycarbonyl, $C_3–C_8$-cyclo-alkylsulfonyl, mono- or di-$(C_1–C_8$-alkyl)amino, each of the last 21 radicals being unsubstituted or substituted by one or more radicals from the group consisting of halogen, $C_1–C_4$-alkoxy, $C_1–C_4$-haloalkoxy, CN, NO_2, OH, NH_2, mono- and di-$(C_1–C_3$-alkyl)amino, $C_1–C_4$-alkylthio and $C_1–C_4$-haloalkylthio and, in the case of cyclic radicals, also $C_1–C_4$-alkyl and $C_1–C_4$-haloalkyl, or is aryl or hetaryl, each of the last 2 radicals being unsubstituted or substituted by one or more radicals from the group consisting of $C_1–C_4$-alkyl, $C_1–C_4$-haloalkyl, $C_1–C_4$-alkoxy, $C_1–C_4$-haloalkoxy, CN and NO_2, or the part of the formula

from the group of the abovementioned formula B1 (see definition of B) as a whole forms a heterocyclic ring having an imino function, wherein said rings are selected from a ring of the formulae D1 to D15

D1

D2

D3

D4

D5

D6

D7

D8

D9

D10

D11

-continued

D12

D13

D14

D15

wherein said rings D1 to D15 are unsubstituted or substituted by one or more radicals from the group consisting of halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy, OH, NH_2, CN, NO_2, mono- and di-(C_1–C_4-alkyl)amino.

R^{18} is hydrogen, C_{1-C8}-alkyl, C_2–C_8-alkenyl, C_2–C_8-alkynyl, C_1–C_8-alkylsulfonyl, (C_1–C_8-alkyl)carbonyl, (C_1–C_8-alkoxy)-carbonyl, C_1–$_5$-alkoxy, C_3–C_8-cycloalkyl, C_5–C_8-cycloal-kenyl, C_3–C_8-cycloalkylsulfonyl, C_3–C_8-cycloalkylcarbonyl, C_3–C_8-cycloalkoxycarbonyl or C_3–C_8-cycloalkoxy, each of the last 13 radicals being unsubstituted or substituted by one or more radicals from the group consisting of halogen, C_1–C_3-alkoxy, C_1–C_3-haloalkoxy and, in the case of cyclic radicals, also C_1–C_4-alkyl and C_1–C_4-haloalkyl, or is CHO, NH_2, OH, mono- or di-(C_1–C_4-alkyl)amino,

R^{19} is a radical selected from the group of the radicals as defined for R^{17} and

R^{20} is hydrogen, C_1–C_8-alkyl, C_3–C_8-cycloalkyl, C_2–C_8-alkenyl, C_3–C_8-cycloalkenyl or C_2–C_6-alkynyl or

$NR^{19}R^{20}$ is a heterocyclic ring, having 3 to 6 ring atoms and, in addition to the 1-nitrogen atom, may optionally contain one further hetero ring atom selected from the group consisting of N, O, and S which is unsubstituted or substituted by one or more radicals from the group consisting of halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, OH, NH_2, NO_2, CN, mono- and di-(C_1–C_5-alkyl)amino,

R^{21} is a radical from the group of the radicals possible for R^{16},

R^{22} is hydrogen, C_1–C_8-alkyl, C_2–C_8-alkenyl, C_2–C_8-alkynyl, C_1–C_8-alkoxy, C_1–C_8-alkylthio, C_3–C_8-cycloalkoxy, C_3–C_8-cycloalkylthio, C_3–C_8-cycloalkyl, C_5–C_8-cycloalkenyl, mono- or di-(C_1–C_8-alkyl)amino, each of the last 11 radicals being unsubstituted or substituted by one or more radicals from the group consisting of CN, halogen, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy and, in the case of cyclic radicals, also C_1–C_4-alkyl and C_1–C_4-haloalkyl, or is aryl or hetaryl,

R^{23} is C_1–C_8-alkyl, C_2–C_8-alkenyl, C_2–C_8-alkynyl, C_3–C_8-cycloalkyl, C_5–C_8-cycloalkenyl, heterocyclyl, aryl or benzyl, each of the last 8 radicals being unsubstituted or substituted by one or more radicals from the group consisting of halogen, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, CN and NO_2 and, in the case of cyclic radicals, also C_1–C_4-alkyl and C_1–C_4-haloalkyl,

R^{24} is hydrogen, OH, NH_2, aryl or a heterocycle, each of the last two radicals being unsubstituted or substituted, or is C_1–C_8-alkyl, C_2–C_8-alkenyl, C_2–C_8-alkynyl, C_1–C_8-alkoxy, C_2–C_8-alkenyloxy, C_2–C_8-alkynyloxy, C_1–C_8-alkylthio, C_2–C_8-alkenylthio, C_2–C_8-alkynylthio, benzyl, aryloxy, benzyloxy, C_3–C_8-cycloalkyl, C_5–C_8-cycloalkenyl, C_3–C_8-cycloalkoxy, C_5–C_8-cycloalkenyloxy, C_5–C_8-cycloalkylthio or C_5–C_8-cycloalkenylthio, mono- or di-(C_1–C_8-alkyl)amino, each of the last 20 radicals being unsubstituted or substituted by one or more radicals from the group consisting of halogen, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, OH, NH_2, mono- and di-(C_1–C_4-

alkyl)amino, CN and NO_2 and, in the case of cyclic radicals, also C_1–C_4-alkyl and C_1–C_4-haloalkyl,

R^{25} is a radical from the group of the radicals possible for R^{24},

R^{26} is hydrogen, OH, NH_2, CN, C_1–C_8-alkoxy, C_2–C_8-alkenyloxy, C_2–C_8-alkynyloxy, C_1–C_8-alkyl, C_2–C_8-alkenyl, C_2–C_8-alkynyl, C_1–C_8-alkylsulfonyl, C_2–C_8-alkenylsulfonyl, C_2–C_8-alkynylsulfonyl, C_3–C_8-cycloalkoxy, C_5–C_8-cycloalkenyloxy, C_3–C_8-cycloalkyl, C_5–C_8-cycloalkenyl, C_3–C_8-cycloalkylsulfonyl, C_5–C_8-cycloalkenylsulfonyl, arylsulfonyl or aryl or a heterocycle or benzyl, (C_1–C_8-alkoxy)carbonyl, (C_1–C_8-alkyl)carbonyl, phenoxycarbonyl, benzylcarbonyl or heterocyclylcarbonyl, each of the last 24 radicals being unsubstituted or substituted,

R^{27} is a radical from the group of the radicals possible for R^{24}, excluding OH,

R^{28} is H, OH, CHO, C_1–C_8-alkyl, C_2–C_8-alkenyl, C_2–C_8-alkynyl, C_1–C_8-alkoxy, C_2–C_8-alkenyloxy, C_2–C_8-alkynyloxy, C_1–C_8-alkylsulfonyl, C_2–C_8-alkenylsulfonyl, C_2–C_8-alkynylsulfonyl, (C_1–C_8-alkyl)carbonyl, (C_2–C_8-alkenyl)carbonyl, (C_2–C_8-alkynyl)-carbonyl, (C_1–C_8-alkoxy)carbonyl, (C_2–C_8-alkenyloxy)carbonyl, (C_2–C_8-alkynyloxy)carbonyl, mono- or di-(C_1–C_8-alkyl)-aminocarbonyl, C_3–C_8-cycloalkyl, C_5–C_8-cycloalkenyl, C_3–C_8-cycloalkoxy, C_5–C_8-cycloalkenyloxy, C_3–C_9-cycloalkylsulfonyl, C_5–C_8-cycloalkenylsulfonyl, C_3–C_8-cycloalkoxycarbonyl, C_5–C_8-cycloalkenyloxycarbonyl, benzoyl, benzyl, benzylcarbonyl, benzyloxycarbonyl, aryl or a heterocycle, each of the last 31 radicals being unsubstituted or substituted, or is SO_2NH_2 or $CONH_2$,

R^{29} is a radical from the group of the radicals possible for R^{28}, excluding OH,

R^{30} is a radical from the group of the radicals possible for R^{19},

R^{31} is a radical from the group of the radicals possible for R^{20}, or $NR^{30}R^{31}$ as a whole forms a heterocyclic ring as defined for $NR^{19}R^{20}$,

R^{32} is hydrogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, CHO, C_1–C_4-alkylsulfonyl, C_2–C_4-alkenyl, C_2–C_4-alkynyl, C_2–C_4-haloalkenyl, C_1–C_4-haloalkyl, C_2–C_4-haloalkynyl, C_1–C_4-haloalkylsulfonyl, (C_1–C_4-alkyl)carbonyl, (C_1–C_4-alkoxy)carbonyl, (C_1–C_4-haloalkyl)carbonyl or (C_1–C_4-haloalkoxy)carbonyl,

R^{33} is a radical from the group of the radicals possible for R^{32} or $NR^{32}R^{33}$ as a whole forms a heterocyclic ring as defined for $NR^{19}R^{20}$. and wherein, unless otherwise defined,

aryl is a mono-, bi- or polyaromatic ring system which has 6 to 12 carbon atoms which is substituted or unsubstituted,

hetaryl is a mono-, bi- or polyaromatic ring system which has 6 to 12 carbon atoms wherein one of said carbon atoms is replaced by a heteroatom selected from the group consisting of N, O, and sulfur or is heterering selected from the group consisting of pyrimidine, pyridazine, pyrazine, thiazole, oxazole, pyrazole, imidazole, quinoline, and benzoxazole which are substituted or unsubstituted; heterocyclyl or heterocyclic ring is saturated, unsaturated or aromatic ring containing 3 to 8 carbon atoms wherein one of the carbon atoms is replaced by a hetero atom selected from the group consisting of N, O, and S, or is a heterering selected from the group consisting of piperdine, piperazine, dioxolane, morpholine, pyrimidine, pyridazine, thiazole, oxazole, pyrazole, imidazole, quinoline, and benzoxazole, which are substituted or unsubstituted; and said substituents on the aryl, hetaryl, heterocyclyl or heterocyclic ring are one or more radicals selected from the group consisting of halogen, C_1–C_4-alkyl, C_2–C_4-alkenyl, C_2–C_4-alkenyl, aryl, heterocyclyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, OH, NH, NH_2, NO_2, CN, N≡N, C_1–C_4-alkylthio, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylcarbonyl, formyl, carbamoyl, mono-(C_1–C_4)-alkylamino, di-(C_1–C_4)-alkylamino, mono-(C_1–C_4)alkylamino carbonyl, di(C_1–C_4-alkyl)carbonyl, acylamino, C_1–C_4-alkylsulfinyl, halo-(C_1–C_4)-alkylsulfinyl, C_1–C_4-alkylsulfonyl, halo(C_1–C_4-alkyl)sulfonyl, C_2–C_4-alkenyloxy, and C_2–C_4-alkynyloxy.

US 6,410,483 B1

PHENYLSULFONYLUREAS, PROCESSES FOR THEIR PREPARATION, AND THEIR USE AS HERBICIDES AND PLANT GROWTH REGULATORS

Klaus Lorenz, Weiterstadt; Lothar Willms, Hofheim; Klaus Bauer, Hanau; Hermann Bieringer, Eppstein, and Christopher Rosinger, Hofheim, all of Germany, assignors to Hoechst Schering AgrEvo GmbH, Berlin, Germany

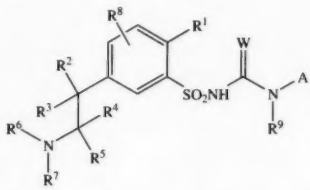
Filed Jan. 21, 1998, Appl. No. 10,457

Claims priority, application Germany, Jan. 23, 1997, 197 02 200

Int. Cl. C07D *239/69;403/12;* **A01N** *43/54*

U.S. Cl. 504—215 **10 Claims**

1. A compound of the formula (1) or a salt thereof



in which

R^1 is an acyl radical of the formula $S(O)_n$—R^{10} or CO—Q—R^{11},

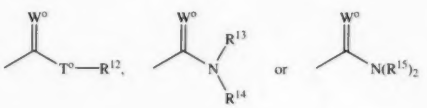
R^2, R^3, R^4, R^5 are identical or different radicals selected from the group consisting of H, (1–6)alkyl, (1–4)alkoxy, (1–4)haloalkyl, (1–4)haloalkoxy and halogen,

R^6 is H, OH, formyl, a radical of the formula R, R—O—, R—CO, R—O—CO—, R—SO_2—, R—SO— or RR^0NSO_2—, in which each of the radicals R and R^0 is a hydrocarbon radical which is unsubstituted or substituted, and,

R^7 is CHO, [(1–6)alkyl]carbonyl, [(2–6)alkenyl]carbonyl, [(2–6)alkynyl]carbonyl, (1–6)alkylsulfonyl, (2–6)alkenylsulfonyl, (2–6)alkynylsulfonyl, [(3–6)cycloalkyl]carbonyl, [(5–6)cycloalkenyl]carbonyl, [(3–6)cycloalkyl]-sulfonyl, (5–6)cycloalkenylsulfonyl, each of the 10 last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1–4)alkoxy, (1–4)alkylthio, (1–4)alkyl sulfonyl, (1–4)alkylsulfinyl, (1–4)alkylcarbonyl, [(1–4)alkoxy]carbonyl, [(1–4)alkyl]carbonyloxy and CN and, in the case of cyclic radicals, also by (1–4)alkyl and (1–4)haloalkyl, or

phenylcarbonyl or phenylsulfonyl, each of the two last-mentioned radicals being unsubstituted or substituted in the phenyl ring by one or more radicals selected from the group consisting of halogen, CN, NO_2, (1–4)alkyl, (1–4)haloalkyl, (1–4)alkoxy and (1–4)haloalkoxy, or

mono- or di[(1–4)alkyl]aminosulfonyl which is unsubstituted or substituted in the alkyl moiety by one or more radicals selected from the group consisting of halogen, (1–4)alkoxy, (1–4)alkylthio, (1–4)alkylsulfinyl, (1–4)alkylsulfonyl, [(1–4)alkyl]carbonyl, [(1–4)alkyl]carbonyloxy, [(1–4)alkoxy]carbonyl and CN, or a group of the formula COCOR' in which R'=H, OH, (1–4)alkoxy or (1–4)alkyl, or a group of the formula



or

NR^6R^7 together are a chain of the formula —$(CH_2)_{m1}B^1$ of —B^1—$(CH_2)_{m2}$—B^2—, where m1 is 3, 4 or 5 and m2 is 2, 3 or 4

B^1 is SO_2 or CO,

B^2 is SO_2 or CO

W is an oxygen or sulfur atom,

W^o is O or S,

T^o is O or S,

R^8 is H, (1–6)alkyl, (2–6)alkenyl, (1–6)alkoxy, (1–4)alkylthio, [(1–4)alkyl]-carbonyl or [(1–4)alkoxy]carbonyl, each of the six last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1–4)alkoxy, (1–4)alkylthio and CN, or is halogen, NO_2, CN, NH_2 or mono- or disubstituted amino,

R^9 is H or (1–6)alkyl,

R^{10} is NH_2, mono- or disubstituted amino or a hydrocarbon radical which is unsubstituted or substituted, and which,

n is the number 0, 1 or 2, with the exception of the case R^{10}=NH_2 or mono- or disubstituted amino, in which case n=2,

R^{11} is H or a hydrocarbon radical which is unsubstituted or substituted, or is a heterocycle wherein said heterocycle is an aliphatic heterocyclyl radical having 3 to 7 ring atoms or a heteroaromatic radical having 5 to 6 ring atoms, wherein 1 of the ring atoms is a heteroatom selected from the group consisting of N, O, and S, or is pyrimidinyl, pyridazinyl, pyrazinyl, thiazolyl, oxazol, pyrazolyl, imidazol, piperidinyl, piperazinyl, dioxolanyl, or morpholinyl, wherein said groups are unsubstituted or substituted, and,

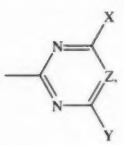
R^{12} is (1–4)alkyl, (3–4)alkenyl or (3–4)alkynyl, each of the three last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1–4)alkoxy, (1–4)alkylthio, [(1–4)alkyl]carbonyl and [(1–4)alkoxy]carbonyl,

R^{13}, R^{14} independently of one another are H, (1–4)alkyl, (3–4)alkenyl or (3–4)alkynyl, each of the three last-mentioned radicals being unsubstituted or substituted by one or more of the radicals selected from the group consisting of halogen, (1–4)alkoxy, (1–4)alkylthio, [(1–4)alkyl]carbonyl and [(1–4)alkoxy]carbonyl,

the radicals R^{15} together with the nitrogen atom are a heterocyclic ring which has 5 or 6 ring members, may contain one further hetero atom selected from the group consisting of N, O and S at the oxidation levels which are possible and which is unsubstituted or substituted by (1–4)alkyl or the oxo group, or which is benzo-fused,

Q is an oxygen or sulfur atom or a group of the formula —NR'— in which R' is H or a hydrocarbon radical which is unsubstituted or substituted, or is an acyl radical,

A is a radical of the formula



one of the radicals X and Y is hydrogen, halogen, (1–3)alkyl or (1–3)alkoxy, each of the two last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1–3)alkoxy and (1–3)alkylthio, and the other of the radicals X and Y is hydrogen, halogen, (1–3)alkyl, (1–3)alkoxy or (1–3)alkylthio, each of the three last-mentioned alkyl containing radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1–3)alkoxy and (1–3)alkylthio, or is a radical of the formula NR^aR^b, (3–6)cycloalkyl, (2–4)alkenyl, (2–4)alkynyl, (3–4)alkenyloxy or (3–4)alkynyloxy,

Z is CH,

R^a and R^b independently of one another are H, (1–4)alkyl or (2–4)alkenyl,

wherein the hydrocarbon radical is defined as alkyl, alkenyl, alkynyl or aryl having up to 12 carbon atoms, and when substituted, the substituents are halogen, (1–4)alkoxy, (1–4)haloalkoxy, (1–4)alkylthio, hydroxy, amino, nitro, (1–4)carboxy, cyano, azido, [(1–4)-alkoxy]carbonyl, [(1–4)alkyl]carbonyl, formyl, carbamoyl, mono(1–4)alkylaminocarbonyl, di(1–4)alkylaminocarbonyl, acylamino, mono(1–4)alkylamino, (1–4)alkylsulfinyl, (1–4)haloalkylsulfinyl, (1–4)alkylsulfonyl, (1–4)haloalkylsulfonyl, (2–4)alkenyl, (2–4)alkynyl, (2–4)alkenyloxy, (2–4)alkynyloxy, mono- or disubstituted amino; unsubstituted or N-substituted hydroxylamino, or unsubstituted or N-substituted hydrazino, wherein the substitution on the last 4 mentioned substituted radicals are selected from the groups consisting of (1–4)alkyl, (1–4)alkoxy, (1–4)acyl, and (6–12)aryl,

wherein the substituents on the aryl or heterocyclic groups are those identified above for the hydrocarbon radical or when an aliphatic heterocycle radical are also oxo, and

wherein the substitutents on the mono- and di-substituted amino radicals are selected from the group consisting of (1–4)alkyl, (1–4)alkoxy, (1–4)acyl and (6–12)aryl.

US 6,410,484 B1

6-HYDROXY-5,6-DIHYDROURACIL COMPOUND AND HERBICIDAL COMPOSITION CONTAINING THEREOF

Minoru Takano, Kameoka, and Hirofumi Mishima, Minoo, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 30, 2000, Appl. No. 698,211

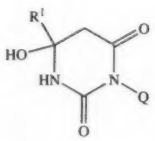
Claims priority, application Japan, Nov. 1, 1999, 11-310756; Mar. 1, 2000, 2000-055432

Int. Cl. A01N *43/12;43/54;43/84;* **C07D** *239/22*

U.S. Cl. 504—221 **17 Claims**

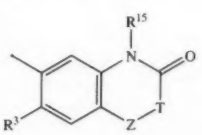
1. A 5,6-dihydrouracil compound represented by the formula [I]:

[I]

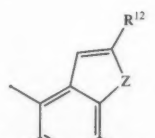


wherein R^1 represents C1–C2 haloalkyl group and Q represents any group of Q1 to Q8 represented by the formulae below:

Q1



Q2



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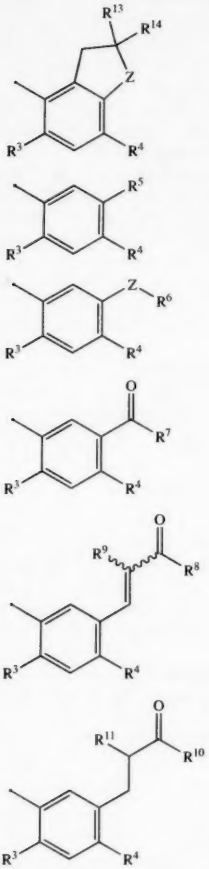
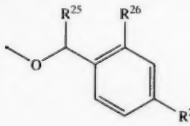


wherein Z represents oxygen atom, sulfur atom or NH group; T represents direct bond or methylene group;

R^3 represents hydrogen atom or halogen atom; R^4 represents hydrogen atom, halogen atom, cyano group, nitro group, ethynyl group or a group given by the formula:

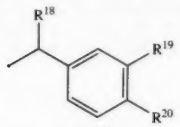


R^5 represents hydrogen atom, C1–C6 alkyl group, halogen atom, cyano group, nitro group or hydroxy group; R^6 represents C1–C6 alkyl group, C1– C6 haloalkyl group, C3–C8 cycloalkyl group, (C3–C8 cycloalkyl) C1–C3 alkyl group, C3–C6 alkenyl group, C3–C6 alkynyl group, cyano C1–C3 alkyl group, (C1–C3 alkoxy) C1–C3 alkyl group, (C1–C3 alkylthio) C1–C3 alkyl group, (C1–C6 alkyl)carbonyl group, (C1–C6 haloalkyl)carbonyl group, (C3– C8 cycloalkyl)carbonyl group, carboxy C1–C3 alkyl group, (C1–C6 alkoxy)carbonyl C1–C3 alkyl group, (C1–C6 haloalkoxy-)carbonyl C1–C3 alkyl group, (C3–C8 cycloalkoxy)carbonyl C1–C3 alkyl group, (C3–C6 alkenyloxy)carbonyl C1–C3 alkyl group, (C3–C6 alkynyloxy)carbonyl C1–C3 alkyl group, C1–C3 alkoxy (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, carboxy (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, (C1–C6 alkoxy)carbonyl (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, (C1–C6 haloalkoxy)carbonyl (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, (C3–C6 alkenyloxy)carbonyl (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, (C3–C6 alkynyloxy)carbonyl (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, (C3–C8 cycloalkoxy)carbonyl (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, optionally substituted aryloxycarbonyl C1–C3 alkyl group, optionally substituted aryl (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, (C1–C6 alkoxy)carbonyl group, or a group given by the formula $—SO_2R^{17}$, $—C(R^{28})R^{29}CON(R^{21})R^{22}$, $—C(R^{30})R^{31}COON(R^{23})R^{24}$

Q3

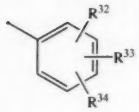
Q4

Q5



or

Q6

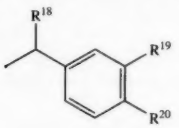


; R^7 represents hydrogen atom, C1–C6 alkyl group, C1–C6 haloalkyl group, C3–C8 cycloalkyl group, hydroxy group, C1–C6 alkoxy group, C1–C6 haloalkoxy group, C3–C8 cycloalkoxy group, C3–C6 alkenyloxy group, C3– C6 alkynyloxy group, (C1–C3 alkoxy) C1–C3 alkoxy group, carboxy C1–C3 alkoxy group, (C1–C6 alkoxy)carboxy C1–C3 alkoxy group, (C3–C8 cycloalkoxy)carboxy C1–C3 alkoxy group, (C3–C6 alkenyloxy-)carboxy C1– C3 alkoxy group, (C3–C6 alkynyloxy)carboxy C1–C3 alkoxy group, optionally substituted phenoxy group, optionally substituted benzyloxy group, or a group given by the formula $—N(R^{21})R^{22}$ or $—ON(R^{23})R^{24}$; R8 represents hydroxy group, C1–C6 alkoxy group, C1–C6 haloalkoxy group, C3–C8 cycloalkoxy group, C3–C6 alkenyloxy group, C3–C6 alkynyloxy group, (C1–C3 alkoxy) C1–C3 alkoxy group, optionally substituted phenoxy group, optionally substituted benzyloxy group, or a group given by the general formula $—N(R^{21})R^{22}$ or $—ON(R^{23})R^{24}$; R^9 represents hydrogen atom or halogen atom; R^{10} represents hydroxy group, C1–C6 alkoxy group, C1–C6 haloalkoxy group, C3–C8 cycloalkoxy group, C3–C6 alkenyloxy group, C3– C6 alkynyloxy group, (C1–C3 alkoxy) C1–C3 alkoxy group, optionally substituted phenoxy group, optionally substituted benzyloxy group, or a group given by the general formula $—N(R^{21})R^{22}$ or $—ON(R^{23})R^{24}$; R^{11} represents hydrogen atom or halogen atom; R^{12} represents hydrogen atom, formyl group, cyano group, nitro group, amino group, C1–C6 alkyl group, C1–C6 haloalkyl group, hydroxy C1–C3 alkyl group, (C1–C3 alkoxy) C1–C3 alkyl group, (C1–C6 alkyl)carbonyloxy C1–C3 alkyl group, (C1–C6 haloalkyl)carbonyloxy C1–C3 alkyl group, carboxy group, (C1–C6 alkoxy)carbonyl group, (C1–C6 haloalkoxy)carbonyl group, (C3–C8 cycloalkoxy)carbonyl group, (C3–C6 alkenyloxy)carbonyl group, (C3–C6 alkynyloxy)carbonyl group or C1–C3 alkoxy (C1–C3 alkoxy)carbonyl group; R^{13} represents hydrogen atom or C1–C3 alkyl group; R^{14} represents hydrogen atom, C1–C6 alkyl group, C1–C6 haloalkyl group, hydroxy C1–C3 alkyl group, (C1–C3 alkoxy) C1–C3 alkyl group, (C1–C6 alkyl-)carbonyloxy C1–C3 alkyl group, (C1–C6 haloalkyl)carbonyloxy C1–C3 alkyl group, carboxy group, (C1–C6 alkoxy)carbonyl group, (C1–C6 haloalkoxy)carbonyl group, (C3–C8 cycloalkoxy-)carbonyl group, (C3–C6 alkenyloxy)carbonyl group, (C3–C6 alkynyloxy)carbonyl group or C1–C3 alkoxy (C1–C3 alkoxy)carbonyl group; R^{15} represents C1–C6 alkyl group, C1–C6 haloalkyl group, C3–C8 cycloalkyl group, (C3–C8 cycloalkyl) C1–C3 alkyl group, C3– C6 alkenyl group, C3–C6 alkynyl group, cyano C1–C3 alkyl group, (C1–C3 alkoxy) C1–C3 alkyl group, (C1–C3 alkylthio) C1–C3 alkyl group, (C1–C6 alkyl)carbonyl group, (C1–C6 haloalkyl)carbonyl group, (C3–C8 cycloalkyl)carbonyl group, carboxy C1–C3 alkyl group, (C1–C6 alkoxy)carbonyl C1–C3 alkyl group, (C1–C6 haloalkoxy)carbonyl C1–C3 alkyl group, (C3–C8

Q7

Q8

cycloalkoxy)carbonyl C1–C3 alkyl group, (C3–C6 alkenyloxy)carbonyl C1–C3 alkyl group, (C3–C6 alkynyloxy)carbonyl C1–C3 alkyl group, C1–C3 alkoxy (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, carboxy (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, (C1–C6 alkoxy)carbonyl (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, (C1–C6 haloalkoxy)carbonyl (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, (C3–C8 cycloalkoxy)carbonyl (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, (C3–C6 alkenyloxy)carbonyl (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, (C3–C6 alkynyloxy-)carbonyl (C1–C3 alkoxy)carbonyl C1–C3 alkyl group, optionally substituted aryloxycarbonyl C1–C3 alkyl group, optionally substituted aryl (C1–C3 alkyloxy)carbonyl C1–C3 alkyl group, (C1–C6 alkoxy)carbonyl group or a group given by the formula:



wherein R^{17} represents C1–C3 alkyl group or C1–C3 haloalkyl group; R^{18} represents hydrogen atom, C1–C3 alkyl group or (C1–C6 alkoxy)carbonyl group; R^{19} represents hydrogen atom, halogen atom, nitro group, hydroxy group, C1–C6 alkyl group, C1–C6 haloalkyl group, C1–C6 alkoxy group, C1–C6 haloalkoxy group, C3–C8 cycloalkoxy group, C3–C6 alkenyloxy group, C3–C6 alkynyloxy group, carboxy C1–C3 alkoxy group, (C1–C6 alkoxy)carbonyl C1–C3 alkoxy group, (C3–C8 cycloalkoxy)carbonyl C1–C3 alkoxy group, (C3–C6 alkenyloxy)carbonyl C1–C3 alkoxy group or (C3–C6 alkynyloxy)carbonyl C1–C3 alkoxy group; R^{20} represents hydrogen atom, halogen atom, nitro group, hydroxy group, C1–C6 alkyl group, C1–C6 haloalkyl group, C1–C6 alkoxy group, C1–C6 haloalkoxy group, C3–C8 cycloalkoxy group, C3–C6 alkenyloxy group, C3–C6 alkynyloxy group, carboxy C1–C3 alkoxy group, (C1–C6 alkoxy)carbonyl C1–C3 alkoxy group, (C3–C8 cycloalkoxy)carbonyl C1–C3 alkoxy group, (C3–C6 alkenyloxy)carbonyl C1–C3 alkoxy group or (C3–C6 alkynyloxy)carbonyl C1–C3 alkoxy group; R^{21} and R^{22} independently represent hydrogen atom or C1–C3 alkyl group, or combined together at their terminal ends to form C2–C5 alkylene group or C1–C3 alkyleneoxy C1–C3 alkylene group; R^{23} and R^{24} independently represent hydrogen atom or C1–C3 alkyl group, or combined together at their terminal ends to form C2–C5 alkylene group or (C1–C3 alkyleneoxy) C1–C3 alkylene group; R^{25} represents hydrogen atom, C1–C3 alkyl group or (C1–C6 alkoxy)carbonyl group; R^{26} represents hydrogen atom, halogen atom, nitro group, hydroxy group, C1–C6 alkyl group, C1–C6 haloalkyl group, C1–C6 alkoxy group, C1–C6 haloalkoxy group, C3–C8 cycloalkoxy group, C3–C6 alkenyloxy group, C3–C6 alkynyloxy group, carboxy C1–C3 alkoxy group, (C1–C6 alkoxy)carbonyl C1–C3 alkoxy group, (C3–C8 cycloalkoxy)carbonyl C1–C3 alkoxy group, (C3–C6 alkenyloxy)carbonyl C1–C3 alkoxy group or (C3–C6 alkynyloxy)carbonyl C1–C3 alkoxy group; R^{27} represents hydrogen atom, halogen atom, nitro group, hydroxy group, C1–C6 alkyl group, C1–C6 haloalkyl group, C1–C6 alkoxy group, C1–C6 haloalkoxy group, C3–C8 cycloalkoxy group, C3–C6 alkenyloxy group, C3–C6 alkynyloxy group, carboxy C1–C3 alkoxy group, (C1–C6 alkoxy)carbonyl C1–C3 alkoxy group, (C3–C8 cycloalkoxy)carbonyl C1–C3 alkoxy group, (C3–C6 alkenyloxy-)carbonyl C1–C3 alkoxy group or (C3–C6 alkynyloxy)carbonyl C1–C3 alkoxy group; R^{28} represents hydrogen atom or C1–C3 alkyl group; R^{29} represents hydrogen atom or C1–C3 alkyl group; R^{30} represents hydrogen atom or C1– C3 alkyl group; R^{31} represents hydrogen atom or C1– C3 alkyl group; R^{32}, R^{33} and R^{34} are the same or different and represent hydrogen atom, halogen atom, C1–C3 alkyl group, C1–C3 haloalkyl group, nitro group, amino group, hydroxy group, mercapto group, cyano group, carboxy group, (C1–C6 alkoxy)carbonyl group, (C3–C8 cycloalkoxy)carbonyl group, (C3–C6 alkenyloxy)carbonyl group, (C3–C6 alkynyloxy)carbonyl group, carboxy C1–C3 alkyl group, (C1–C6 alkoxy-)carbonyl C1–C3 alkyl group, (C3–C8 cycloalkoxy)carbonyl C1–C3 alkyl group, (C3–C6 alkenyloxy)carbonyl C1–C3 alkyl group, (C3–C6 alkynyloxy)carbonyl C1–C3 alkyl group, carboxy C1–C3 alkoxy group, (C1–C6 alkoxy)carbonyl C1–C3 alkoxy group, (C3–C8 cycloalkoxy)carbonyl C1–C3 alkoxy group, (C3–C6 alkenyloxy)carbonyl C1–C3 alkoxy group, (C3–C6 alkynyloxy)carbonyl C1– C3 alkoxy group, carboxy C1–C3 alkylthio group, (C1–C6 alkoxy)carbonyl C1–C3 alkylthio group, (C3–C8 cycloalkoxy)carbonyl C1–C3 alkylthio group, (C3–C6 alkenyloxy-)carbonyl C1–C3 alkylthio group, (C3–C6 alkynyloxy)carbonyl C1–C3 alkylthio group, carboxy C1–C3 alkylamino group, (C1–C6 alkoxy)carbonyl C1–C3 alkylamino group, (C3–C8 cycloalkoxy)carbonyl C1–C3 alkylamino group, (C3–C6 alkenyloxy)carbonyl C1–C3 alkylamino group, (C3–C6 alkynyloxy)carbonyl C1–C3 alkylamino group, C1–C6 alkoxy group, C3–C6 alkenyloxy group, C3–C6 alkynyloxy group, (C1–C6 alkyl)carbonyloxy group, (C1–C6 alkoxy)carbonyloxy group, C1–C6 alkylthio group, C3–C6 alkenylthio group, C3–C6 alkynylthio group, (C1–C6 alkyl)carbonylthio group, (C1–C6 alkoxy)carbonylthio group, C1–C6 alkylamino group, C3–C6 alkenylamino group, C3–C6 alkynylamino group, (C1–C6 alkyl)carbonylamino group or (C1–C6 alkoxy)carbonylamino group.

US 6,410,485 B1

SACCHARIN-5-CARBONYL DERIVATIVES WITH HERBICIDAL EFFECT

Ulf Misslitz, Neustadt; Ernst Baumann, Dudenhofen; Wolfgang von Deyn, Neustadt; Steffen Kudis, Mannheim; Klaus Langemann, Worms; Guido Mayer, Neustadt; Ulf Neidlein, Mannheim; Matthias Witschel, Ludwigshafen; Roland Götz, Neulussheim; Michael Rack, Heidelberg; Peter Plath, Frankenthal; Martina Otten, Ludwigshafen; Karl-Otto Westphalen, Speyer, and Helmut Walter, Obrigheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP00/01408, § 371 Date Sep. 5, 2001, § 102(e) Date Sep. 5, 2001, PCT Pub. No. WO00/53590, PCT Pub. Date Sep. 14, 2000

PCT Filed Feb. 21, 2000, Appl. No. 914,797

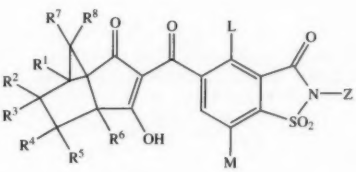
Claims priority, application Germany, Mar. 5, 1999, 199 09 645

Int. Cl. A01N *43/80;* **A61K** *31/428;* **C07D** *275/06*

U.S. Cl. 504—269 **15 Claims**

1. A saccharin-5-carbonyl derivative of the formula I

I



in which the substituents have the following meanings:

L is C_1–C_5-alkyl, C_1–C_6-alkoxy;

Z is C_1–C_6-alkyl, C_3–C_8-cycloalkyl, C_3–C_6-alkenyl, C_3–C_5-alkynyl, phenyl-C_1–C_6-alkyl or phenyl, where the phenyl rings can be mono- or polysubstituted by C_1–C_6-alkyl, C_1–C_6-alkoxy or halogen;

M is hydrogen, C_1–C_6-alkyl, C_1–C_6-alkoxy, halogen, cyano, nitro or halo-C_1–C_6-alkyl;

R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8 are hydrogen or C_1–C_6-alkyl;

or the agriculturally utilizable salts of the compound I.

US 6,410,486 B2

CYCLOALKYLALKANECARBOXAMIDES AND THEIR PREPARATION AND USE

Frank Wetterich, Mutterstadt; Karl Eicken, Wachenheim; Gisela Lorenz, Neustadt; Eberhard Ammermann, Heppenheim; Siegfried Strathmann, Limburgerhof, and Ingo Rose, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

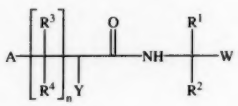
Division of application No. 09/381,050, filed as application No. PCT/EP98/01031, filed on Feb. 23, 1998, now Pat. No. 6,265,447. This application May 31, 2001, Appl. No. 867,524. Claims priority, application Germany, Mar. 14, 1997, 197 10 618

Int. Cl. A01N *37/34;* **C07C** *255/00*

U.S. Cl. 504—312 **17 Claims**

1.A cycloalkylalkanecarboxamide of the formula I

I



where the substituents have the following meanings:

A is a substituted C_3–C_6-cycloalkyl;

R^1 is C_1–C_6-alkyl or C_2–C_6-alkenyl, it being possible for these radicals to be partially or fully halogenated and/or to have attached to them one or two of the following groups: C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-alkoxycarbonyl, C_3–C_6-cycloalkyl and phenyl, it being possible for the phenyl to be partially or fully halogenated and/or have attached to it one to three of the following radicals: nitro, cyano, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_3–C_6-cycloalkyl or heterocyclyl;

R^2, R^3 and R^4 are hydrogen or, independently of this meaning, have one of the meanings of the radical R^1;

n is 0;

Y is cyano;

W is phenyl, naphthyl or heteroaryl which can have attached to it one to three of the following groups: nitro, halogen, cyano, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_3–C_6-cycloalkyl and C_1–C_4-alkoxycarbonyl.

US 6,410,487 B1

LARGE AREA BULK SUPERCONDUCTORS

Dean J. Miller, Darien, Ill., and Michael B. Field, Jersey City, N.J., assignors to The University of Chicago, Chicago, Ill.

Filed Jul. 20, 2000, Appl. No. 619,934

Int. Cl. H01B *12/02;* **H01L** *39/24*

U.S. Cl. 505—239 **24 Claims**

Superconductor material carried by a multilayered polycrystalline material

1. A bulk superconductor having a thickness of not less than about 100 microns carried by a polycrystalline textured material having misorientation angles at the surface thereof not greater than about 15°.

US 6,410,488 B1

DRILLING FLUID

Michael Fefer, Whitby, and Lorne Pierson, Calgary, both of Canada, assignors to Petro-Canada, Mississauga, Canada

Provisional application No. 60/123,871, filed on Mar. 11, 1999. This application Mar. 10, 2000, Appl. No. 523,519.

Int. Cl. C09K *7/02;7/06*

U.S. Cl. 507—103 **41 Claims**

1. A method for producing a drilling fluid having a hydrocarbon oil component as a continuous phase, the method comprising the steps of:

(a) hydrotreating a crude oil feedstock to obtain a hydrotreated product;

(b) hydroisomerizing the hydrotreated product to obtain a hydroisomerized product;

(c) hydrogenating the hydroisomerized product to obtain the fluid; and,

(d) adding at least one additive selected from the group of additives consisting of emulsifiers, gellants, weighting agents and clays.

US 6,410,489 B1

FOAM-FLUID FOR FRACTURING SUBTERRANEAN FORMATIONS

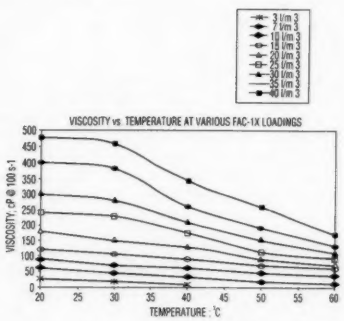
Kewei Zhang; Ron Pierce, both of Calgary; Nicole Deanne Litt, Ft. Saskatchewan, and D. V. Satyanarayana Gupta, Calgary, all of Canada, assignors to BJ Services Company Canada, Calgary, Canada

Filed Dec. 29, 1999, Appl. No. 474,149

Claims priority, application Canada, Dec. 31, 1998, 2257697

Int. Cl. C09K *3/00*

U.S. Cl. 507—202 **7 Claims**



1. A foam fracturing fluid for use in fracturing subterranean formations surrounding oil and gas wells comprising water, an anionic surfactant, cationic surfactant, and a gaseous foaming agent, wherein the ratio of said anionic surfactant to said cationic surfactant is in the range from about 1:1 to about 1:1.95, by volume, and wherein at total loadings of surfactant of up to about 6% by volume, said fluid delivers viscosity suitable for use as a fracturing fluid at 10°–70° C.

US 6,410,490 B1

STABILIZED HYDROTREATED AND HYDROWAXED LUBRICANT COMPOSITIONS

Jose L. Reyes-Gavilan, Clifton, N.J.; Frederick T. Lichtenberg, Hartsdale, N.Y.; Adesola O. Oshode, Bronx, N.Y.; Miles J. Hutchings, Eastchester, N.Y.; Peter Collen Hamblin, Flüg, Switzerland; Michael Fletschinger, Bad Krozingen-Biengen, Germany, and Peter Rohrbach, Liestal, Switzerland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Provisional application No. 60/134,805, filed on May 19, 1999. This application May 18, 2000, Appl. No. 573,402.

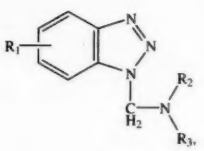
Int. Cl. C10M *141/08;141/06*

U.S. Cl. 508—243 **27 Claims**

1. A lubricant composition which comprises

(a) a hydrotreated oil or a hydrodewaxed oil;

(b) (i) an effective stabilizing amount of a metal deactivator of the formula (I)



(I)

wherein

R_1 is hydrogen or C_1–C_{12}alkyl, and

R_2 and R_3, each independently of the other, are hydrogen, C_1–C_{20}alkyl, C_3–C_{20}alkenyl, C_5–C_{12}cycloalkyl, C_7–C_{13}aralkyl, C_6–C_{10}aryl, hydroxy, or

R_2 and R_3, together with the nitrogen to which they are bonded, form a 5-, 6- or 7-membered heterocyclic residue or

R_2 and R_3 is each a residue of the formula (II)

$$R_4X[(\text{alkylene})O]_n(\text{alkylene})— \quad \text{(II)},$$

wherein

X is O, S or NR_4;

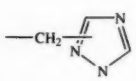
R_4 is hydrogen or C_1–C_{20}alkyl;

alkylene is a C_1–C_{12}alkylene residue; and

n is 0 or an integer from 1 to 6; or

R_2 is as defined above and R_3 is a residue of the formula (III)

(III)



or is a residue of the formula (II) as defined above and R_2 is a residue of the formula (IV)

$$\text{-[alkylene]}_n—N(R_5)—A—[N(R_5)_2]_m \quad \text{(IV)},$$

wherein m is 0 or 1 and,

when m is 0, A is a residue of the formula (III) and,

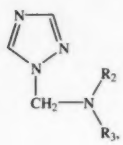
when m is 1, A is alkylene or C_6–C_{10} arylene; and

alkylene and n have their above-mentioned meanings; and

R_5 is a residue of the formula (III), as defined above; or

(ii) an effective stabilizing amount of a metal deactivator of the formula (V)

(V)



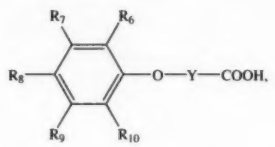
wherein R_2 and R_3 are as defined above;

(c) an effective stabilizing amount of a sterically hindered phenolic antioxidant;

(d) an effective stabilizing amount of an aromatic amine antioxidant;

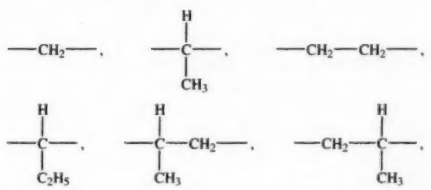
(e) an effective stabilizing amount of an alkyl phenoxy alkanoic acid of the formula (VI)

(VI)



wherein R_6, R_7, R_8, R_9 and R_{10} are, each independently of the other, hydrogen or C_1–C_{20}alkyl and

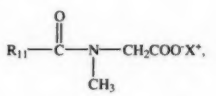
Y is a divalent C_1–C_{20} hydrocarbon radical, saturated or unsaturated, selected from the group consisting of



and —CH_2—CH_2—CH_2—; and

(f) an effective stabilizing amount of an N-acyl sarcosine derivative of the formula (VII)

(VII)



wherein

the acyl group R_{11}—C(=O)— is the residue of a fatty acid having 10 to 20 carbon atoms and X^+ is the hydrogen ion, an alkali metal ion or an ammonium ion.

US 6,410,491 B1

POLYALKENYL SULFONATES

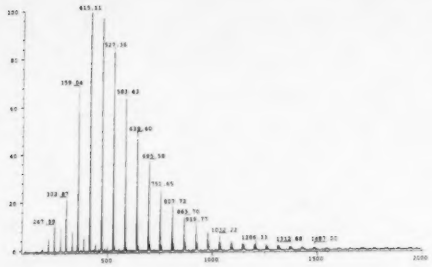
James J. Harrison, Novato, and Curtis B. Campbell, Hercules, both of Calif., assignors to Chevron Chemical Company LLC, San Ramon, Calif.

Filed Mar. 17, 2000, Appl. No. 527,166

Int. Cl. C10M *159/24;151/00*

U.S. Cl. 508—391 **86 Claims**

1. A polyisobutenyl sulfonic acid composition derived only from polyisobutene comprising greater than 20 mole percent alkyl vinylidene and 1,1-dialkyl isomers.



23. An overbased polyalkenyl sulfonate composition wherein the polyalkenyl sulfonate is an alkali metal or alkaline earth metal salt of a polyalkenyl sulfonic acid derived from a mixture of polyalkenes comprising greater than 20 mole percent alkyl vinylidene and 1,1-dialkyl isomers.

US 6,410,492 B1

MIXED ESTERS OF PENTAERYTHRITOL FOR REFRIGERATION BASE OILS

Yuji Shimomura, Yokohama, and Hiroyuki Hirano, Tokyo, both of Japan, assignors to Nippon Mitsubishi Oil Corporation, Tokyo, Japan

PCT No. PCT/JP99/04763, § 371 Date Mar. 1, 2001, § 102(e) Date Mar. 1, 2001, PCT Pub. No. WO00/14189, PCT Pub. Date Mar. 16, 2000

PCT Filed Sep. 2, 1999, Appl. No. 786,053

Claims priority, application Japan, Sep. 2, 1998, 10-248210

Int. Cl. C10M *105/38;* **C09K** *5/04*

U.S. Cl. 508—485 **9 Claims**

1. A refrigerator oil comprising an ester obtained from:

pentaerythritol; and

a carboxylic acid mixture comprising n-pentanoic acid in an amount of 20 to 50% by mass; n-heptanoic acid in an amount of 20 to 50% by mass and 3,5,5-trimethylhexanoic acid in an amount of 5 to 60% by mass, of the total amount of the carboxylic acid mixture.

US 6,410,493 B1

CONDITIONING AND DETERGENT COMPOSITION COMPRISING AN ANIONIC SURFACTANT, A SILICONE, AND A CATIONIC POLYMER

Nathalie Garnier, Springfield, N.J., assignor to L'Oreal S.A., Paris, France

Filed Nov. 12, 1999, Appl. No. 438,965

Claims priority, application France, Nov. 12, 1998, 98 14217

Int. Cl. C11D *1/04;3/37;9/36*

U.S. Cl. 510—119 **29 Claims**

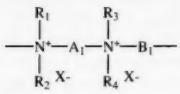
1. A cosmetic conditioning and detergent composition comprising:

(A) at least one anionic surfactant derived from a carboxylic acid, wherein said at least one anionic surfactant does not include a sulphate or sulphonate function and wherein said at least one anionic surfactant is present in an amount ranging from 3 to 50% by weight, relative to the total weight of the composition;

(B) at least one silicone which does not include an amide function, which is present in a conditioning amount; and

(C) at least one cationic polymer, which contains quaternary ammonium groups in the polymeric main chain, chosen from:

(1) quaternary diammonium polymers containing repeating units of the formula:



(I)

wherein R_1, R_2, R_3, and R_4, which are identical or different, are chosen from aliphatic, alicyclic, and arylaliphatic radicals containing 1 to 20 carbon atoms or lower hydroxyalkyl aliphatic radicals; or else R_1, R_2, R_3, and R4, together or separately, together with the nitrogen atoms to which they are attached, form heterocycles optionally containing a second heteroatom other than nitrogen; or else R_1, R_2, R_3, and R_4 are chosen from linear and branched C_1–C_6 alkyl radicals substituted by a group chosen from nitrile, ester, acyl, amide, —CO—O—R_5—D, and —CO—NH—R_5—D, wherein R_5 is chosen from alkylenes and D is chosen from quaternary ammonium groups;

A_1 and B_1 are chosen from linear and branched, saturated and unsaturated polymethylene groups which contain 2 to 20 carbon atoms, and which can contain, bonded to or intercalated in the polymeric main chain, at least one aromatic ring or at least one group chosen from an oxygen atom, a sulfur atom, and sulphoxide, sulphone, disulphide, amino, alkylamino, hydroxyl, quaternary ammonium, ureido, amide, and ester groups,

X^- is chosen from anions derived from a mineral or organic acid;

A_1, R_1 and R_3 can, together with the two nitrogen atoms to which they are attached, form a piperazine ring; and, if A_1 is a linear or branched, saturated or unsaturated alkylene or hydroxyalkylene radical, B_1 may also be a group $(CH_2)_n$—CO—D—OC—$(CH_2)_n$—

in which D is chosen from:

a) a glycol residue of formula —O—Z—O—, in which Z is chosen from linear and branched hydrocarbon radicals,

—$(CH_2$—CH_2—$O)_x$—CH_2—CH_2—, and

—$(CH_2$—$CH(CH_3)$—$O)_y$—CH_2—$CH(CH_3)$—

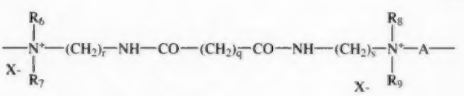
in which x and y are chosen from integers from 1 to 4, representing a defined and single degree of polymerization, and any number from 1 to 4, representing an average degree of polymerization;

b) a bis-secondary diamine residue;

c) a bis-primary diamine residue of formula —NH—Y—NH—, in which Y is chosen from linear and branched hydrocarbon radicals and the divalent radical —CH_2—CH_2—S—S—CH_2—CH_2—;

d) a ureylene group of formula —NH—CO—NH—,

(2) quaternary polyammonium polymers comprising of units of formula (II):



(II)

wherein R_6, R_7, R_8 and R_9, which are identical or different, are chosen from a hydrogen atom, a methyl, ethyl, propyl, β-hydroxyethyl, β-hydroxypropyl, and —$CH_2CH_2(OCH_2CH_2)_pOH$ radical,

in which p is an integer ranging from 0 to 6, with the proviso that R_6, R_7, R_8 and R_9 are not simultaneously a hydrogen atom,

r and s, which are identical or different, are integers ranging from 1 to

q is an integer ranging from 0 to 34,

X is chosen from halogen atoms,

A is a radical of a dihalide or —CH_2—CH_2—O—CH_2—CH_2—,

(3) polymers comprising piperazinyl units and radicals chosen from divalent straight-chain and branched hydroxyalkylene and alkylene radicals, optionally interrupted by oxygen, sulphur or nitrogen atoms or by aromatic or heterocyclic rings, and the oxidation and/or quaternization products of these polymers,

(4) water-soluble polyaminoamides,

(5) polyaminoamide derivatives resulting from the condensation of polyalkylene polyamines with polycarboxylic acids followed by alkylation with bifunctional agents,

(6) polymers obtained by reacting a polyalkylene polyamine containing two primary amine groups and at least one secondary amine group with a dicarboxylic acid chosen from diglycolic acid and saturated aliphatic dicarboxylic acids having 3 to 8 carbon atoms, wherein the molar ratio of polyalkylene polyamine to dicarboxylic acid ranges from 0.8:1 to 1.4:1; the resulting polyaminoamide being reacted with epichlorohydrin in a molar ratio ranging from 0.5:1 to 1.8:1 of epichlorohydrin relative to the secondary amine group of the polyaminoamide,

(7) alkyldiallylamine and dialkyldiallylammonium cyclic polymers, and

(8) quaternary polymers of vinylpyrrolidone and vinylimidazolium.

US 6,410,494 B2

CLEANING AGENT

Masahiko Kakizawa; Osamu Ichikawa, and Ichiro Hayashida, all of Saitama, Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Division of application No. 09/658,926, filed on Sep. 11, 2000, which is a division of application No. 08/868,891, filed on Jun. 4, 1997, now Pat. No. 6,143,705. This application Feb. 22, 2001, Appl. No. 789,736.

Claims priority, application Japan, Jun. 5, 1996, 8-165353

Int. Cl. C11D *7/26;* **G03F** *7/42*

U.S. Cl. 510—175 **22 Claims**

17. A cleaning method for a semiconductor substrate surface having metallized wirings, which comprises treating the semiconductor surface with a cleaning agent consisting essentially of (1) an organic agent selected from citric acid, oxalic acid, malonic acid, tartaric acid, fumaric acid, succinic acid, glutaric acid and adipic acid and (2) a complexing agent selected from ethylenediamine tetra (methylenephosphonic acid), hexamethaphosphoric acid, acetylacetone, trans-1,2-diaminocyclohexane tetraacetic acid, ethylenediamine tetraacetic acid, ammonium ion, halide ion, 1-hydroxyethylydene-1,1'-diphosphonic acid, cyanide ion, nitrilotris (methylenephosphonic acid), thiocyanate ion and ethylenediamine di (methylenephosphonic acid) to remove metallic contaminants on the surface without corroding the metallized wirings.

US 6,410,495 B1

STABLE SOLID BLOCK METAL PROTECTING WAREWASHING DETERGENT COMPOSITION

Steven E. Lentsch; Victor F. Man, both of St. Paul, and Keith E. Olson, Apple Valley, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Continuation of application No. 09/089,095, filed on Jun. 2, 1998, now Pat. No. 6,156,715, which is a continuation-in-part of application No. 08/781,493, filed on Jan. 13, 1997, now Pat. No. 6,177,392. This application Oct. 19, 2000, Appl. No. 692,122.

This patent is subject to a terminal disclaimer.

Int. Cl. C11D *17/00;3/08;3/10;3/36;* **B08B** *9/20*

U.S. Cl. 510—224 **24 Claims**

1. A continuous extruded or cast solid detergent composition comprising: a solidified mixture comprising:

(a) about 10 to 80 wt % of Na_2CO_3;

(b) an alkali metal silicate having a $M_2O:SiO_2$ ratio of about 1:1 to 1:5; and

(c) an effective amount of an organic phosphonate hardness sequestering agent comprising a potassium salt;

wherein the mixture hardens to a solid form within about 1 minute to about 20 minutes, and the composition comprises about 5 to 20 wt % anhydrous sodium carbonate and binding agent comprising sufficient amounts of hydrated sodium carbonate and phosphonate comprising a potassium salt, to form the composition, and the composition provides metal protection and comprises either no second source of alkalinity or less than a solidification interfering amount of a second source of alkalinity.

US 6,410,496 B1

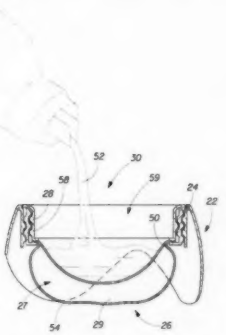
LAUNDRY DEVICES FOR DELIVERING DYE TRANSFER INHIBITING BENEFITS

Axel Masschelein, Brussels; Patrick Firmin August Delplancke, Destelbergen; Lucresse Gemma Van Wonterghem, Temse, all of Belgium, and Terence Graham Curtis, Bucks, United Kingdom, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 29, 1999, Appl. No. 431,552

Int. Cl. C11D *17/04;* **D06F** *39/02*

U.S. Cl. 510—277 **17 Claims**



1. A laundry device for use with a washing machine, comprising:

a bag storing a substantially water-insoluble dye transfer inhibiting compound, said bag having a plurality of apertures allowing wash water to flow through said bag but substantially preventing said substantially water-insoluble dye transfer inhibiting compound from exiting said bag during use; and

a container having a compartment for receiving a laundry product.

US 6,410,497 B1

ACTIVATORS FOR PER COMPOUNDS COMPRISING OXIME CARBONATES OR OXIME POLYMERS

Elisabeth Kappes, Limburgerhof; Thomas Wehlage, Speyer; Alfred Oftring, Bad Dürkheim, and Dieter Boeckh, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP98/00574, § 371 Date Aug. 4, 1999, § 102(e) Date Aug. 4, 1999, PCT Pub. No. WO98/33878, PCT Pub. Date Aug. 6, 1998

PCT Filed Feb. 3, 1998, Appl. No. 355,335

Claims priority, application Germany, Feb. 4, 1997, 197 04 143

Int. Cl. C11D *3/395*

U.S. Cl. 510—376 **19 Claims**

1. A method of activating inorganic per compounds, comprising contacting an inorganic per compound with a compound selected from the group consisting of

(1) a carbonate represented by formula (I):

$$A—O—CO—OR^3 \quad (I)$$

wherein

A is a radical represented by formula (Ia):

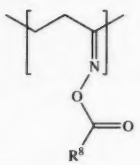
$$R^1R^2C{=}N— \quad (Ia)$$

wherein R^1, R^2 and R^3 are each, independently, a straight-chain or branched C_{1-30}-alkyl, C_{2-30}-alkenyl, C_{5-18}-cycloalkyl, C_{7-18}-aralkyl or C_{6-18}-aryl or heteroaryl, it being possible for aliphatic radicals to be functionalized additionally by 1 to 5 hydroxyl, C_{1-4}-alkoxy, amino, C_{1-4}-alkoxyamino, di-C_{1-4}-alkylamino, nitro, cyano, carboxyl, sulfo, carboxy-C_{1-4}-alkyl or carboxamide groups, chlorine or bromine atoms or by phenyl, tolyl or benzyl, it likewise being possible for aromatic, cycloaliphatic and heteroaromatic structural units to be substituted by these functions or to be interrupted by 1 to 8 nonadjacent oxygens or amino, C_{1-4}-alkylamino or carbonyl groups, and

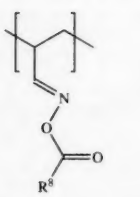
R^1 and R^2, furthermore, can be hydrogen or together form a 1,3-, 1,4-, 1,5-, 1,6-, 1,7- or 1,8-alkylene group of 3 to 33 C atoms which can be functionalized additionally by 1 to 5 hydroxyl, C_{1-4}-alkylamino, di-C_{1-4}-alkylamino, nitro, cyano, carboxyl, sulfo, carboxy-C_{1-4}-alkyl or carboxamide groups, chlorine or bromine atoms or phenyl, tolyl or benzyl, and where aromatic radicals in turn can likewise be substituted by these functions, or can be interrupted by one or two nonadjacent oxygens or amino, C_{1-4}-alkylamino or carbonyl groups,

and R^3 is not a vinyl which can be substituted by a carboxylic, sulfonic or phosphonic acid group or an alkali metal salt or ammonium salt thereof and is not a vinyloxy radical —O—CR^1=CHR^2 in which R^1 and R^2 are as defined above,

(2) a polymer which can comprise C_{2-8} olefin comonomer units and comprise base units represented by formulae (IV) and/or (V):



(IV)



(V)

wherein R^8 is a radical R^3 or —OR^3 wherein R^3 is as defined above.

US 6,410,498 B1

LAUNDRY DETERGENT AND/OR FABRIC CARE COMPOSITIONS COMPRISING A MODIFIED TRANSFERASE

Johan Smets, Lubbeek, Belgium; Mary Vijayarani Barnabas, West Chester, Ohio; Michael Stanford Showell, Cincinnati, Ohio; Stanton Lane Boyer, Fairfield, Ohio, and André Christian Convents, Cincinnati, Ohio, assignors to Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US99/09480, § 371 Date Nov. 1, 2000, § 102(e) Date Nov. 1, 2000, PCT Pub. No. WO99/57254, PCT Pub. Date Nov. 11, 1999

PCT Filed Apr. 30, 1999, Appl. No. 674,472

Int. Cl. C11D *7/02;3/386;* **C12N** *9/10;15/62;* **D06M** *16/00*

U.S. Cl. 510—392 **38 Claims**

1. A modified enzyme which comprises a catalytically active amino acid sequence of a transferase linked to an amino acid sequence comprising a cellulose binding domain via a linking region selected from the group consisting of, *Humicola insolens* family 45 cellulase linker, NifA gene of *Klebsiella pneumonia*-CiP linker, *E. coli* OmpA gene-CiP linker, E3 cellulase *Thermomonospora fusca* linker, CenA cellulase linker, polyethylene glycol derivatives, 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide, N-ethyl-5-phenylisoaxolium-3-sulphonate, N-ethoxycarbonyl-2-ethoxy 1,2,dihydroquinoline or glutaraldehyde, crosslinkers and combinations thereof; wherein said transferase is selected from the group consisting of: EC 2.1.1.15, EC 2.1.1.18, EC 2.1.2.1, EC 2.1.2.4, EC 2.2.1.3, EC 2.3.1.3, EC 2.3.1.18, EC 2.3.1.57, EC 2.3.1.75, EC 2.3.1.79, EC 2.3.1.84, EC 2.3.1.88, EC 2.3.1.96, EC 2.3.1.142, EC 2.4.1.2, EC 2.4.1.4, EC 2.4.1.5, EC 2.4.1.9, EC 2.4.1 .10, EC 2.4.1.11, EC 2.4.1.12, EC 2.4.1.13, EC 2.4.1.16, EC 2.4.1.18, EC 2.4.1.21, EC 2.4.1 24, EC 2.4.1.25, EC 2.4.1.29, EC 2.4.1.34, EC 2.4.1.35, EC 2.4.1.49, EC 2.4.1.67, EC 2.4.1.71, EC 2.4.1.75, EC 2.4.1.82, EC 2.4.1.90, EC 2.4.1.93, EC 2.4.1.99, EC 2.4.1.100, EC 2.4.1.113, EC 2.4.1.121, EC 2.4.1.125, EC 2.4.1.140, EC 2.4.1.161, EC 2.4.1.168, EC 2.4.1.169, EC 2.4.1.183, EC 2.5.1.10, EC 2.5.1.20, EC 2.6.1, 2.3.2.13, xyloglucan endotransglycosylase (XET), endo-xyloglucan transferase (EXGT) and combinations thereof.

US 6,410,499 B1

ANTIBACTERIAL CLEANING WIPE COMPRISING AMMONIUM SALT DISENFECTANT

Jean Julemont, Verviers; Isabelle Leonard, Voroux-lez-Liers, and Didier Dormal, Aywaille, all of Belgium, assignors to Colgate-Palmolive Co., Piscataway, N.J.

Continuation-in-part of application No. 09/904,342, filed on Jul. 12, 2001, now Pat. No. 6,346,506. This application Dec. 7, 2001, Appl. No. 10,074.

Int. Cl. C11D *17/00*

U.S. Cl. 510—438 **11 Claims**

1. A cleaning wipe for hard surfaces which comprises approximately:

(a) 20 wt. % to 30 wt. % of a nonwoven fabric which consists of 60–95% wood pulp fibers, 2.5 to 20% viscose fibers, 2.5 to 20% polyester fibers; and

(b) 70 wt. % to 80 wt. % of a liquid cleaning composition being impregnated in said nonwoven fabric, wherein said liquid cleaning composition comprises:

(i) 0.5 wt. % to 8 wt. % of at least one ethoxylated nonionic surfactant;

(ii) 0.5 wt. % to 10 wt. % of a C_1–C_4 alkanol;

(iii) 0.5 wt. % to 8 wt. % of a cosurfactant;

(iv) 0.25 wt % to 15% wt. % of an anionic surfactant;

(v) 0.1 wt. % to 4 wt. % of a proton donating agent;

(vi) 0.1 to 2.0 wt. % of a disinfecting agent selected from the group consisting of tetralkyl ammonium salt or a trialkyl benzyl ammonium salt; and

(vii) the balance being water, wherein the composition has a pH of about 3.5 to about 5.5.

US 6,410,500 B1

MOULDED BODY DISHWASHER DETERGENTS WITH SOIL RELEASE POLYMERS

Juergen Haerer, Duesseldorf; Thomas Mueller-Kirschbaum, Solingen; Christian Nitsch; Thomas Moeller, both of Duesseldorf; Hans-Josef Beaujean, Dormagen, and Bernd Richter, Leichlingen, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP98/08368, § 371 Date May 8, 2000, § 102(e) Date May 8, 2000, PCT Pub. No. WO99/35234, PCT Pub. Date Jul. 15, 1999

PCT Filed Dec. 21, 1998, Appl. No. 446,451

Claims priority, application Germany, Dec. 30, 1997, 197 58 181

Int. Cl. C11D *17/00;3/37*

U.S. Cl. 510—445 **21 Claims**

1. A shaped body comprising builders, alkali sources, bleaching agents, enzymes, surfactants, and an ingredient (I), wherein a defined region of no greater than 40% by volume of the shaped body comprises more than 80% by weight of the total amount of the ingredient (I) that is contained in said shaped body, further wherein said ingredient (I) comprises at least one soil-release compound selected from the group consisting of cationic polymers, polyuronic acids, polyampholytes, and hydrophobicized polyampholytes.

US 6,410,501 B1

FABRIC CONDITIONING CONCENTRATE

Craig Warren Jones, and Mansur Sultan Mohammadi, both of Wirral, United Kingdom, assignors to Unilever Home & Personal Care USA, division of Conopco, Inc., Greenwich, Conn.

Filed Jul. 26, 2000, Appl. No. 625,761

Claims priority, application United Kingdom, Jul. 26, 1999, 9917537

Int. Cl. C11D *3/22*

U.S. Cl. 510—515 **15 Claims**

1. A fabric conditioning concentrate comprising:

i) 20 to 78 weight percent of a nonionic fabric conditioning compound comprising a liquid or soft solid derivative of a cyclic polyol (CPE) or of a reduced saccharide (RSE) resulting from 35 to 100% of the hydroxyl groups in the cyclic polyol or reduced saccharide being esterified or etherified, the derivative (CPE or RSE) having at least 2 or more of ester or ether groups independently attached to a C_8–C_{22} alkyl or alkenyl chain or mixtures thereof, and containing at least 35% tri or higher esters;

ii) a deposition aid,

iii) an emulsifying agent, and

iv) less than 30% by weight water.

US 6,410,502 B1

SOFTENER COMPOSITIONS

Tohru Katoh; Yasuki Ohtawa, and Yohei Kaneko, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

PCT No. PCT/JP99/03098, § 371 Date Jan. 5, 2001, § 102(e) Date Jan. 5, 2001, PCT Pub. No. WO99/64660, PCT Pub. Date Dec. 16, 1999

PCT Filed Jun. 10, 1999, Appl. No. 700,541

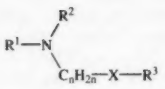
Claims priority, application Japan, Jun. 10, 1998, 10-162327

Int. Cl. C11D *1/46;1/52;1/835;3/30;3/32*

U.S. Cl. 510—515 **9 Claims**

1. A softener composition which comprises:

a component (A) comprising an amine represented by the following formula (III):



(III)

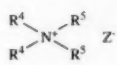
wherein R^1 represents a hydrogen atom, a C_{1-3} alkyl group, $-(C_mH_{2m}O)_p-H$, $-C_nH_{2n}-X-R^3$ or $-C_qH_{2q}-Y-R^3$; m, n and q are the same or different and each of m, n and q represents an integer of 1 to 6; p represents a number selected from 1 to 10; R^3 represents a linear or branched C_{5-22} alkyl or alkenyl group; X represents —OCO— or —COO—; Y represents —NHCO— or —CONH—; and R^2 represents $-C_qH_{2q}-Y-R^3$;

a salt of said component (A); or

a mixture of said component (A) and a component (B); or

the salt of said component (A) and a component (B):

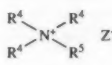
wherein said component (B) comprises a compound represented by the following formula (II-2),



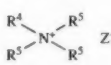
(II-2)

wherein each R^4 independently represents a C_{1-3} alkyl group or $-(C_mH_{2m}O)_p-H$, each R^5 independently represents a C_{6-22} alkyl or alkenyl group, $-C_nH_{2n}-X-R^3$ or $-C_qH_{2q}-Y-R^3$; each of m, n, p, q, R^3, X and Y has the same meaning as defined above; Z^- represents an anion;

and wherein said component (B) optionally further comprises at least one compound represented by the formulae (II-1) or (II-3),



(II-1)

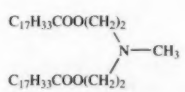


(II-3)

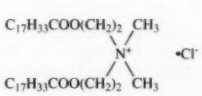
wherein R^4, R^5, m, n, q, p, R^3, X and Y have the same meaning as defined above: and

wherein the ratio of the component (A) to the component (B), namely (A)/(B), by weight is from 2/8 to 8/2, and wherein the content of the component (B) is 11 to 50% by weight:

provided that the softener composition does not contain both the component (A) which is represented by the following formula (a-1) and the component (B) which is represented by the following formula (b-1),



(a-1)



(b-1)

US 6,410,503 B1

FABRIC CARE COMPOSITIONS

Axel Masschelein, Brussels, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US98/24816, § 371 Date May 24, 2000, § 102(e) Date May 24, 2000, PCT Pub. No. WO99/27055, PCT Pub. Date Jun. 3, 1999

PCT Filed Nov. 20, 1998, Appl. No. 555,082

Claims priority, application European Pat. Off., Nov. 24, 1997, 97870189

Int. Cl. C11D *3/37*

U.S. Cl. 510—516 **14 Claims**

1. A fabric care composition comprising

a polyamino-functional polymer and

a cellulose reactive dye fixing agent wherein said cellulose reactive dye fixing agent is a product containing the reactive group of the reactive dye classes selected from the group consisting of halogeno-triazine products; vinyl sulphones compounds; epichlorhydrine derivatives; hydroxyothylene urea derivatives; formaldehyde condensation products selected from the condensation products derived from formaldehyde and a group selected from an amino-group, an imino-group, a phenol group, and an aromatic group; polycarboxlates; glyoxal and glutaraldehyde derivatives; and mixtures thereof.

US 6,410,504 B1

NITRILES AND ALDEHYDES DERIVED FROM 3-ISOPROPENYL-1,2-DIMETHYL-1-CYCLOPENTANOL AND THEIR USE IN PERFUMERY

Wolfgang Giersch, Bernex, Switzerland, assignor to Firmenich, SA, Geneva, Switzerland

Division of application No. 09/185,535, filed on Nov. 4, 1998, now Pat. No. 6,180,814. This application Nov. 28, 2000, Appl. No. 722,439.

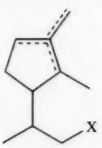
Claims priority, application Switzerland, Nov. 11, 1997, 2592/97

Int. Cl. A61K *7/46;7/32;7/06;7/075;7/50*

U.S. Cl. 512—1 **28 Claims**

1. A method to improve, enhance. or modify the odor of a perfuming composition or a perfumed article comprising adding to said composition or said article an effective amount of a compound or a mixture of compounds of formula

(I)



in which X is a C≡N group or a C(H)═O group and the C_5-ring is either saturated or carries a double bond in one of the positions indicated by the dotted lines.

US 6,410,505 B1

DIMERIC NON-AZO NAPHTHALIMIDES AND USES FOR THE SAME

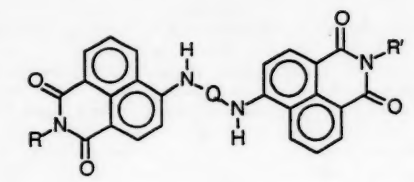
David E. Lewis, Brookings; Ronald E. Utecht, Volga, both of S. Dak.; Millard M. Judy, and J. Lester Matthews, both of Dallas, Tex., assignors to Microbiomed Corp., Dallas, Tex.

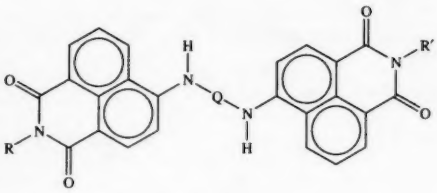
Filed Jun. 28, 1999, Appl. No. 438,306

Int. Cl. A61K *31/695;31/69;31/675;* **C07D** *471/06;* **C07F** *7/02*

U.S. Cl. 514—1 **9 Claims**

1. A compound having the formula:





which is a mixture of stereoisomers, wherein:

R and R' are the same or different and are:

a straight-chain or branched chain alkyl, $C_nH_kX_mY_p$ where X is a Group VIA element selected from the group O, S and Se, Y is a Group VA element selected from the group N, P and As (n=2–200, $1 \leqq m \leqq n$, $1 \leqq p \leqq n$, $2n<m+p<4n$, $1 \leqq k \leqq 2n+1+p$) and wherein they are free of X—X, X—Y or Y—Y bonds; or

monocyclic, polycyclic, fused-ring, bridged ring or spirocyclic alicyclic alkyl $C_nH_{2q+p+1}X_mY_p$ where X is a Group VIA element selected from the group consisting O, S and Se, Y is a Group VA element selected from the group consisting of N, P and As (n=2–200, q<n, $1 \leqq m \leqq n$, $1 \leqq p \leqq n$, $2n<m+p<4n$, $1 \leqq m \leqq n$) with saturated or unsaturated side-chains, branched or unbranched, and wherein they are free of X—X, X—Y or Y—Y bonds; or

a straight-chain or branched chain alkyl, $C_nH_kX_mY_pAr_r$ where X is a Group VIA element selected from the group consisting O, S and Se, Y is a Group VA element selected from the group consisting of N, P and As, Ar is an aryl group derived from an aromatic compound selected from the group consisting of benzene, pyridine, furan, pyrrole, thiophene, indole, imidazole, oxazole, isozazole, thiazole, benzofuran, benzothiophene, benzimidazole, quinoline, isoquinoline, naphthalene, anthracene, acridine, phenanthrene and their alkylated, halogenated, nitrated or sulfonated derivatives (n=2–200, $1 \leqq m \leqq n$, $1 \leqq p \leqq n$, $2n<m+p<4n$, $1 \leqq r \leqq 20$, $1 \leqq k \leqq 2n+1+p-r$) and wherein they are free of X—X, X—Y or Y—Y bonds; or

a straight-chain or branched chain alkyl, $C_nH_kX_mY_pA_a$ where X is a Group VIA element selected from the group consisting of O, S and Se, Y is a Group VA element selected from the group consisting of N, P and As, A is a substituent selected from the group consisting of F, Cl, Br, I, SiZ_3, BZ_2 or AlZ_2, Z is selected from the group consisting of F, Cl, Br, I, OH, OC_tH_{2t+1} (n=2–200, $1 \leqq m \leqq n$, $1 \leqq p \leqq n$, $2n<m+p<4n$, $1 \leqq a \leqq 2n$, $1 \leqq s \leqq 20$, $1 \leqq t \leqq s$, $1 \leqq k \leqq 2n+1+p-a$) and wherein they are free of X—X, X—Y or Y—Y bonds; or

a straight-chain or branched chain alkyl, $C_nH_kX_mY_pB_b$ where X is a Group VIA element selected from the group consisting O, S and Se, Y is a Group VA element selected from the group consisting of N, P and As, A is a poly(α-aminoacid) containing up to 300 residues, (n=2–200, $1 \leqq m \leqq n$, $1 \leqq p \leqq n$, $2n<m+p<4n$, $1 \leqq b \leqq 20$, $1 \leqq s \leqq 20$, $1 \leqq t \leqq s$, $1 \leqq k \leqq 2n+1+p-b$) and wherein they are free of X—X, X—Y or Y—Y bonds;

Q is:

a straight-chain or branched chain alkyl, $C_nH_kX_mY_p$ where X is a Group VIA element selected from the group consisting O, S and Se, Y is a Group VA element selected from the group consisting of N, P and As (n=2–200, $1 \leqq m \leqq n$,

$0 \leqq p \leqq n$, $2n<m+p<4n$, $1 \leqq k \leqq 2n+p$) and wherein they are free of X—X, X—Y or Y—Y bonds; or

monocyclic, polycyclic, fused-ring, bridged ring or spirocyclic alicyclic alkyl $C_nH_{2q+p}X_mY_p$ where X is a Group VIA element selected from the group consisting O, S and Se, Y is a Group VA element selected from the group consisting of N, P and As ($n=2$–200, $q<n$, $1 \leqq m \leqq n$, $0 \leqq p \leqq n$, $2n<m+p<4n$, $1 \leqq m \leqq n$) with saturated or unsaturated side-chains, branched or unbranched, and wherein they are free of X—X, X—Y or Y—Y bonds; or

a straight-chain or branched chain alkyl, $C_nH_kX_mY_pAr_r$ where X is a Group VIA element selected from the group consisting O, S and Se, Y is a Group VA element selected from the group consisting of N, P and As, Ar is an aryl group derived from an aromatic compound selected from the group consisting of benzene, pyridine, furan, pyrrole, thiophene, indole, imidazole, oxazole, isozazole, thiazole, benzofuran, benzothiophene, benzimidazole, quinoline, isoquinoline, naphthalene, anthracene, acridine, phenanthrene and their alkylated, halogenated, nitrated or sulfonated derivatives ($n=2$–200, $1 \leqq m \leqq n$, $0 \leqq p \leqq n$, $2n<m+p<4n$, $1 \leqq r \leqq 20$, $1 \leqq k \leqq 2n+p-r$) and wherein they are free of X—X, X—Y or Y—Y bonds; or

a straight-chain or branched chain alkyl, $C_nH_kX_mY_pA_s$ where X is a Group VIA element selected from the group consisting of O, S and Se, Y is a Group VA element selected from the group consisting of N, P and As, A is a substituent selected from the group consisting of F, Cl, Br, I, SiZ_3, BZ_2 or AlZ_2, Z is selected from the group consisting of F, Cl, Br, I, OH, OC_rH_{2r+1} ($n=2$–200, $1 \leqq m \leqq n$, $0 \leqq p \leqq n$, $2n<m+p<4n$, $1 \leqq a \leqq 2n$, $1 \leqq s \leqq 20$, $1 \leqq t \leqq s$, $1 \leqq k \leqq 2n+p-a$) and wherein they are free of X—X, X—Y or Y—Y bonds; or

a straight-chain or branched chain alkyl, $C_nH_kX_mY_pB_b$ where X is a Group VIA element selected from the group consisting O, S and Se, Y is a Group VA element selected from the group consisting of N, P and As, B is a poly(α-aminoacid) containing up to 300 residues, ($n=2$–200, $1 \leqq m \leqq n$, $0 \leqq p \leqq n$, $2n<m+p<4n$, $1 \leqq b \leqq 20$, $1 \leqq s \leqq 20$, $1 \leqq t \leqq s$, $1 \leqq k \leqq 2n+p-$ b) and wherein they are free of X—X, X—Y or Y—Y bonds;

or pharmaceutically acceptable salts thereof.

US 6,410,506 B1

TRANSFORMING GROWTH FACTOR α HII

Ying-Fei Wei, Darnestown; Paul S. Meissner, Barnesville, and Jian Ni, Gaithersburg, all of Md., assignors to Human Genome Sciences, Inc., Rockville, Md.

PCT No. PCT/US95/06386, § 371 Date Jan. 30, 1998, § 102(e) Date Jan. 30, 1998, PCT Pub. No. WO96/36709, PCT Pub. Date Nov. 21, 1996

PCT Filed May 19, 1995, Appl. No. 930,564

Int. Cl. C12N *15/12;* **A61K** *38/18;* **C07K** *14/475*

U.S. Cl. 514—2 **57 Claims**

1. An isolated protein comprising a polypeptide having an amino acid sequence selected from the group consisting of:

(a) amino acid residues 1–374 of SEQ ID NO:2;

(b) amino acid residues 2–374 of SEQ ID NO:2;

(c) amino acid residues 46 to 374 of SEQ ID NO:2;

(d) amino acid residues 215 to 374 of SEQ ID NO:2;

(e) amino acid residues 46 to 264 of SEQ ID NO:2;

(f) amino acid residues 215 to 264 of SEQ ID NO:2; and

(g) at least 30 contiguous amino acid residues of SEQ ID NO: 2.

US 6,410,507 B1

COMPOUNDS FOR IMMUNOTHERAPY AND DIAGNOSIS OF BREAST CANCER AND METHODS FOR THEIR USE

Steven G. Reed, Bellevue; Jiangchun Xu, Seattle, and Davin C. Dillon, Redmond, all of Wash., assignors to Corixa Corporation, Seattle, Wash.

Continuation-in-part of application No. 09/288,950, filed on Apr. 9, 1999, now abandoned, which is a continuation-in-part of application No. 09/248,178, filed on Feb. 9, 1999, which is a continuation-in-part of application No. 09/118,627, filed on Jul. 17, 1998, which is a continuation-in-part of application No. 08/998,253, filed on Dec. 24, 1997, now abandoned. This application Jul. 2, 1999, Appl. No. 346,327.

Int. Cl. A61K *38/18;38/19;* **C07K** *14/475;14/52*

U.S. Cl. 514—2 **9 Claims**

1. An insolated polypeptide comprising SEQ ID NO:99.

US 6,410,508 B1

GLUCOSE-DEPENDENT INSULINOTROPIC PEPTIDE FOR USE AS AN OSTEOTROPIC HORMONE

Carlos M. Isales, 3413 Woodstone Pl., Augusta, Ga. 30909; Roni J. Bollag, 231 Watervale Rd., Martinez, Ga. 30907, and Howard Rasmussen, 820 Barrett La., Augusta, Ga. 30909

Provisional application No. 60/103,495, filed on Oct. 8, 1998, Provisional application No. 60/103,333, filed on Oct. 7, 1998. This application Oct. 7, 1999, Appl. No. 414,189.

Int. Cl. A01N *37/18;* **A61K** *38/28;39/00;* **C12N** *21/06;1/00;5/00*

U.S. Cl. 514—2 **13 Claims**

1. A method for maintaining or increasing bone density or formation in a female subject having reduced bone mineralization associated with reduced ovarian function comprising administration of an effective amount of Glucose-Dependent Insulinotropic Peptide (GIP) as a pharmaceutically acceptable formulation to said subject, wherein said effective amount comprises sufficient GIP polypeptide to maintain or increase bone density in said subject.

US 6,410,509 B1

USE OF MHC CLASS II LIGANDS AS ADJUVANT FOR VACCINATION AND OF LAG-3 IN CANCER TREATMENT

Frederic Triebel, Versailles, France, assignor to Institut Gustave-Roussy, Villejuif Cedex, France, and Applied Research Systems ARS Holding N.V., Curacao, Netherlands Antilles

Continuation of application No. PCT/EP98/04621, filed on Jul. 23, 1998. This application Jan. 27, 2000, Appl. No. 492,113.

Claims priority, application European Pat. Off., Jul. 25, 1997, 97401800

Int. Cl. A61M *36/14;* **A61K** *38/19;* **C07K** *14/47;14/52*

U.S. Cl. 514—2 **22 Claims**

1. A pharmaceutical composition comprising an effective amount of an antigen able to induce an antigen-specific immune response together with an effective amount of a MHC class II ligand able to boost said antigen-specific immune response, wherein said MHC class II ligand is selected from the group consisting of hLAG-3 and a soluble fragment of hLAG-3, and is present as an adjuvant agent.

US 6,410,510 B1

ADMINISTRATION MODIFIED CILIARY NEUROTROPHIC FACTORS

Nikos Panayotatos, Orangeburg; Keith D. Anderson, Mt. Kisco; Stanley J. Wiegand, Ossining, and Ronald M. Lindsay, Briarcliff Manor, all of N.Y., assignors to Regeneron Pharmaceuticals, Inc., Tarrytown, N.Y.

Filed May 13, 1996, Appl. No. 645,107

Int. Cl. A61K *38/18;38/19*

U.S. Cl. 514—12 **2 Claims**

1. A method of increasing striatal GABAergic neuronal survival comprising direct administration, to the central nervous system, of an effective dose of a modified ciliary neurotrophic factor selected from the group consisting of human ciliary neurotrophic factor as set forth in SEQ. NO. 1 having the modification Gln63→Arg, human ciliary neurotrophic factor as set forth in SEQ. NO. 1 having the modifications Gln63→Arg and Trp64→Ala, human ciliary neurotrophic factor as set forth in SEQ. NO. 1 having the modifications Cys17→Ala and Gln63→Arg and a deletion of the terminal 13 amino acid residues, and human ciliary neurotrophic factor as set forth in SEQ. NO. 1 having the modifications Gln63→Arg and a deletion of the terminal 13 amino acid residues.

US 6,410,511 B2

FORMULATIONS FOR AMYLIN AGONIST PEPTIDES

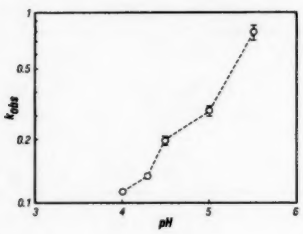
James L'Italien, Del Mar, Calif.; Shankar Musunuri, Exton, Pa., and Kale Ruby, San Diego, Calif., assignors to Amylin Pharmaceuticals, Inc., San Diego, Calif.

Provisional application No. 60/035,140, filed on Jan. 8, 1997. This application Jan. 9, 1998, Appl. No. 5,262.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *38/00*

U.S. Cl. 514—12 **31 Claims**



1. A liquid, pharmaceutical formulation comprising about 0.01 to about 0.5% (w/v) of an amylin agonist, about 1.0 to about 10% (w/v) of a carbohydrate or a polyhydric alcohol, and about 0.02 to about 0.5% (w/v) of an acetate, phosphate, citrate or glutamate buffer, and which has a pH of about 3.0 to about 6.0.

US 6,410,512 B1

INHIBITORS OF PROTEASOMAL ACTIVITY FOR STIMULATING HAIR GROWTH

Gregory R. Mundy; I. Ross Garrett, and G. Rossini, all of San Antonio, Tex., assignors to OsteoScreen, Inc., San Antonio, Tex.

Continuation-in-part of application No. 09/113,947, filed on Jul. 10, 1998. This application Jul. 27, 1999, Appl. No. 361,775.

Int. Cl. A61K *38/00*

U.S. Cl. 514—12 **8 Claims**

1. A method to treat a mammalian subject for a condition benefited by stimulating hair growth which method comprises administering to said mammalian subject in need of such treatment an effective amount of N-carbobenzoyl-Ile-Glu-(OtBu)-Ala-Leu-CHO (PSI).

US 6,410,513 B1

GLUCAGON-LIKE INSULINOTROPIC PEPTIDES, COMPOSITIONS AND METHODS

John A. Galloway, Indianapolis, and James A. Hoffman, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of application No. 09/348,136, filed on Jul. 6, 1999, now Pat. No. 6,133,235, which is a division of application No. 08/927,227, filed on Sep. 10, 1997, now Pat. No. 5,977,071, which is a division of application No. 08/407,831, filed on Mar. 21, 1995, now Pat. No. 5,705,483, which is a continuation-in-part of application No. 08/164,277, filed on Dec. 9, 1993, now abandoned. This application May 18, 2000, Appl. No. 573,809.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *38/00*

U.S. Cl. 514—12 **12 Claims**

1. A glucagon-like peptide-1 complex (GLP-1) comprising a divalent metal cation and a compound of the formula:

R_1-X-Glu-Gly-Thr-Phe-Thr-Ser-Asp-Val-Ser-Ser-Tyr-Leu-Y-Gly-Gln-Ala-Ala-Lys-Z-Phe-Ile-Ala-Trp-Leu-Val-Lys-Gly-Arg-R_2

wherein:

R_1 is selected from the group consisting of L-histidine, D-histidine, desamino-histidine, 2-amino-histidine, -hydroxy-histidine, homohistidine, alpha-fluoromethyl-histidine, and alpha-methyl-histidine;

X is selected from the group consisting of Gly, Val, Thr, Ile, and alpha-methyl-Ala;

Y is selected from the group consisting of Glu, Gln, Ala, Thr, Ser, and Gly;

Z is selected from the group consisting of Glu, Gln, Ala, Thr, Ser, and Gly;

R_2 is selected from the group consisting of NH_2, and Gly-OH; providing that the compound has an isoelectric point in the range from about 6.0 to about 9.0.

US 6,410,514 B1

TISSUE SPECIFIC PRODRUG

John T. Isaacs; Samuel R. Denmeade, both of Baltimore, Md.; S. Brogger Christensen, Copenhagen, Denmark, and Hans Lilja, Skanor, Sweden, assignors to The Johns Hopkins University, Baltimore, Md.

Division of application No. 09/081,707, filed on May 19, 1998, now Pat. No. 6,265,540, Provisional application No. 60/047,070, filed on May 19, 1997, Provisional application No. 60/080,046, filed on Mar. 30, 1998. This application Jun. 7, 2000, Appl. No. 588,921.

Int. Cl. A61K *38/00*

U.S. Cl. 514—13 **33 Claims**

1. A composition comprising a prodrug, the prodrug comprising a therapeutically active drug; and

a peptide comprising an amino acid sequence having a cleavage site specific for an enzyme having a proteolytic activity of prostate specific antigen, wherein the peptide is 20 or fewer amino acids in length, wherein the sequence comprises the amino acids

$X_5X_4X_3X_2X_1$,

wherein X_5 is from 0 to 16 amino acids; X_4 is serine, isoleucine, or lysine; X_3 is serine or lysine; X_2 is leucine or lysine; and X_1 is glutamine, asparagine or tyrosine, and wherein the peptide is linked to the therapeutically active drug to inhibit the therapeutic activity of the drug, and wherein the therapeutically active drug is cleaved from the peptide upon proteolysis by an enzyme having a proteolytic activity of prostate specific antigen (PSA).

US 6,410,515 B1

PEPTIDE, A METHOD FOR ITS PREPARATION AND A PHARMACEUTICAL COMPOSITION CONTAINING THE PEPTIDE

Vladislav I. Deigin, North York, Canada, and Andrei Marxovich Korotkov, Moscow, Russian Federation, assignors to Immunotech Developments Inc., Toronto, Canada

Division of application No. 09/032,550, filed on Feb. 26, 1998, which is a continuation-in-part of application No. 08/657,888, filed on Jun. 7, 1996, now Pat. No. 5,736,519. This application Aug. 27, 1999, Appl. No. 384,873.

Claims priority, application Russian Federation, Jun. 7, 1995, N95108559/04/015649

Int. Cl. A61K *38/06;38/07*

U.S. Cl. 514—19 5 Claims

1. A method of immunosuppressing the immune system in an animal comprising administering an effective amount of a peptide of a formula I:

X-A-D-Trp-Y (I)

wherein X is selected from the group comprising hydrogen, glycine, alanine, leucine, isoleucine, valine, N-valine, proline, tyrosine, phenylalanine, tryptophan, D-alanine, D-leucine, D-isoleucine, D-valine, D-N-valine, D-proline, D-tyrosine, D-phenylalanine, D-tryptophan, γ-aminobutyric acid, and ζ-aminocaproic acid; A is selected from the group comprising D-glutamic acid and D-iso-glutamic acid; and Y is selected from the group comprising glycine, alanine, leucine, isoleucine, valine, N-valine, proline, tyrosine, phenylalanine, tryptophan, D-alanine, D-leucine, D-isoleucine, D-valine, D-N-valine, D-proline, D-tyrosine, D-phenylalanine, D-tryptophan, γ-aminobutyric acid, ζ-aminocaproic acid, hydroxyl and an amide group, to an animal in need thereof.

US 6,410,516 B1

NUCLEAR FACTORS ASSOCIATED WITH TRANSCRIPTIONAL REGULATION

David Baltimore, New York, N.Y.; Ranjan Sen, Cambridge; Phillip A. Sharp, Newton, both of Mass.; Harinder Singh, Chicago, Ill.; Louis Staudt, Silver Springs, Md.; Jonathan H. Lebowitz, Zionsville, Ind.; Albert S. Baldwin, Jr., Chapel Hill, N.C.; Roger G. Clerc, Binningen, Switzerland; Lynn M. Corcoran, Port Melbourne, Australia; Patrick A. Baeuerle, Eichenau, Germany; Michael J. Lenardo, Potomac, Md.; Chen-Ming Fan, San Francisco, and Thomas P. Maniatis, Belmont, both of Mass., assignors to President & Fellows of Harvard College; Massachusetts Institute of Technology, and Whitehead Instittue for Biomedical Research, all of Cambridge, Mass.

Division of application No. 08/418,266, filed on Apr. 6, 1995, now Pat. No. 5,804,374, which is a continuation of application No. 07/791,898, filed on Nov. 13, 1991, now abandoned, which is a continuation-in-part of application No. 06/946,365, filed on Dec. 24, 1986, now abandoned, application No. 08/418,266, which is a continuation-in-part of application No. 07/341,436, filed on Apr. 21, 1989, now abandoned, and a continuation-in-part of application No. 07/318,901, filed on Mar. 3, 1989, now abandoned, and a continuation-in-part of application No. 07/280,173, filed on Dec. 5, 1988, now abandoned, and a continuation-in-part of application No. 07/162,680, filed on Mar. 1, 1988, now abandoned, and a continuation-in-part of application No. 07/155,207, filed on Feb. 12, 1988, now abandoned, and a continuation-in-part of application No. 06/817,441, filed on Jan. 9, 1986, now abandoned. This application Jun. 5, 1995, Appl. No. 464,364.

Int. Cl. A61K *31/711;* C12N *5/10;15/10*

U.S. Cl. 514—44 203 Claims

1. A method for inhibiting expression, in a eukaryotic cell, of a gene whose transcription is regulated by NF-κKB, the method comprising reducing NF-κKB activity in the cell such that expression of said gene is inhibited.

US 6,410,517 B1

TARGETED GENE DELIVERY SYSTEM

Vu L. Truong; Thomas August, both of Baltimore, and Kam W. Leong, Ellicot City, all of Md., assignors to Johns Hopkins University, Baltimore, Md.

Continuation of application No. 08/657,913, filed on Jun. 7, 1996, now Pat. No. 6,025,337, which is a continuation of application No. 08/265,966, filed on Jun. 27, 1994, now abandoned. This application May 20, 1999, Appl. No. 315,033.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *48/00*

U.S. Cl. 514—44 32 Claims

1. A solid microparticle comprising a coacervate of gelatin and nucleic acids, wherein a linking molecule or a targeting ligand is attached to the surface of said microparticle.

US 6,410,518 B1

ANTISENSE OLIGONUCLEOTIDE INHIBITION OF RAF GENE EXPRESSION

Brett P. Monia, LaCosta, Calif., assignor to ISIS Pharmaceuticals, Inc., Carlsbad, Calif.

Continuation-in-part of application No. 09/143,214, filed on Aug. 28, 1998, now Pat. No. 6,090,626, which is a continuation of application No. 08/756,806, filed on Nov. 26, 1996, now Pat. No. 5,952,229, which is a continuation of application No. PCT/US95/07111, filed on May 31, 1995, and a continuation of application No. 08/250,856, filed on May 31, 1994, now Pat. No. 5,563,255, and a continuation-in-part of application No. 08/888,982, filed on Jul. 7, 1997, now Pat. No. 5,981,731, and a continuation-in-part of application No. PCT/US98/13961, filed on Jul. 6, 1998. This application Feb. 18, 2000, Appl. No. 506,073.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *31/7088;31/7115;31/712;31/7125*

U.S. Cl. 514—44 7 Claims

1. A method of treating or preventing a hyperproliferative condition associated with the expression of human raf comprising administering to a human or cells thereof a therapeutically effective amount of an oligonucleotide 8 to 50 nucleotides in length which is targeted to mRNA encoding human raf and which inhibits raf expression so that the hyperproliferative condition is prevented or treated.

US 6,410,519 B1

SCAR REDUCTION

Elliott A. Gruskin, Killingworth, Conn., and Christofer T. Christoforou, Pleasanton, Calif., assignors to United States Surgical Corporation, Norwalk, Conn.

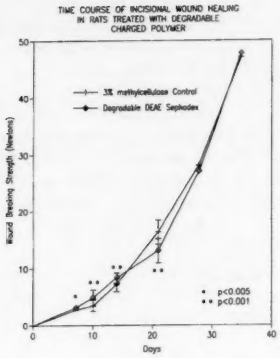
Provisional application No. 60/122,814, filed on Mar. 4, 1999. This application Mar. 3, 2000, Appl. No. 519,006.

Int. Cl. A01N *43/04*

U.S. Cl. 514—59 3 Claims

1. A biocompatible device comprising:

a biocompatible surgical device comprising a structure adapted to contact living tissue, the structure having a scar reducing amount of a cross-linked polysaccharide having a positive



charge, wherein the structure is a prosthetic implant.

US 6,410,520 B2

SELECTIVE CRYSTALLIZATION OF 3-PYRIDYL-1-HYDROXYETHYLIDENE-1, 1-BISPHOSPHONIC ACID SODIUM AS THE HEMIPENTAHYDRATE OR MONOHYDRATE

Frederick Dana Cazer, Earlville, N.Y.; Gregory Eugene Parry, Lawrenceville, N.J.; Dennis Michael Billings, Norwich, and Nancy Lee Redman-Furey, Smyrna, both of N.Y., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Provisional application No. 60/179,505, filed on Feb. 1, 2000. This application Jan. 29, 2001, Appl. No. 771,825.

Int. Cl. A61K *31/663;31/4406;* **C07D** *213/24*

U.S. Cl. 514—89 **18 Claims**

1. A process for selectively producing 3-pyridyl-1-hydroxyethlidene-1,1-bisphosphonic acid sodium hemipentahydrate and monohydrate comprising the steps of:

a) providing an aqueous solution of 3-pyridyl-1-hydroxyethlidene-1,1-bisphosphonic acid sodium;

b) heating the aqueous solution to a temperature from about 45° C. to about 75° C.;

c) adding a solvent to the aqueous solution; and

d) optionally cooling the aqueous solution.

US 6,410,521 B1

NUTRITIONAL SUPPLEMENTS FOR STIMULATING BONE GROWTH

Gregory R. Mundy; I. Ross Garrett, and Gloria E. Gutierrez, all of San Antonio, Tex., assignors to OsteoScreen, Inc., San Antonio, Tex.

Continuation-in-part of application No. 09/488,380, filed on Jan. 20, 2000, which is a continuation-in-part of application No. 09/096,631, filed on Jun. 12, 1998, which is a continuation-in-part of application No. 09/096,957, filed on Jun. 12, 1998. This application Apr. 3, 2000, Appl. No. 541,943.

Int. Cl. A01N *57/00*

U.S. Cl. 514—100 **9 Claims**

1. A method to enhance bone formation in a human characterized by a condition selected from the group consisting of osteoporosis, bone fracture or deficiency, primary or secondary hyperparathyroidism, periodontal disease or defect, metastatic bone disease, osteolytic bone disease, post-plastic surgery, post-prosthetic joint surgery, and post-dental implantation, which method comprises administering to said human, as a dietary supplement, an effective amount of Red Yeast Rice.

US 6,410,522 B1

ANTI-DEPRESSANT, STRESS SUPPRESSOR AND MOOD IMPROVER

David Ruenberg, Haifa, Israel, assignor to Lipogen Ltd., Haifa, Israel

Filed Jul. 3, 2001, Appl. No. 897,034

Claims priority, application Israel, Oct. 23, 2000, 139224

Int. Cl. A61K *31/66*

U.S. Cl. 514—114 **8 Claims**

1. A pharmaceutical or nutritional composition for treating depression, for suppressing mental & emotional stress and for improving mood comprising Phosphatidyl-L-serine and Phosphatidic acid or salts thereof as the effective ingredients, comprising at least 20% (w/w) Phosphatidyl-L-serine out of the total phospholipid content of the composition and at least 3% (w/w) of Phosphatidic acid out of the total phospholipid content of the composition, wherein the Phosphatidyl-L-serine and Phosphatidic acid have a structural fatty acid chain derived from at least one raw material lecithin selected from the group consisting of soy bean lecithin, rapeseed lecithin, and egg yolk lecithin, and which is produced by reaction with Phospholipase-D.

US 6,410,523 B1

VITAMIN D DERIVATIVES SUBSTITUTED AT THE 2BETA-POSITION

Hiroyoshi Watanabe, Tokyo, Japan, assignor to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP99/01898, § 371 Date Oct. 6, 2000, § 102(e) Date Oct. 6, 2000, PCT Pub. No. WO99/52863, PCT Pub. Date Oct. 21, 1999

PCT Filed Apr. 9, 1999, Appl. No. 647,874

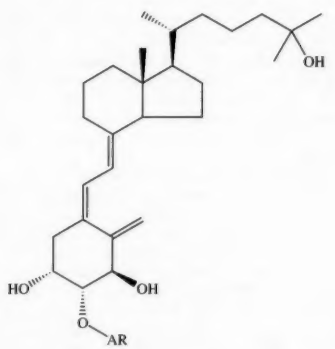
Claims priority, application Japan, Apr. 10, 1998, 10-137361

Int. Cl. C07C *401/00;* **A61K** *31/593*

U.S. Cl. 514—167 **7 Claims**

1. A vitamin D derivative of the general formula (I):

(I)



wherein

A denotes a straight chain or branched chain alkylene group with 2 to 10 carbon atoms; and

R denotes

SO_3R_1 in which R_1 represents a hydrogen atom or a straight chain or branched chain alkyl group with 1 to 3 carbon atoms or

$COOR_2$ in which R_2 represents a hydrogen atom or a straight chain or branched chain alkyl group with 1 to 3 carbon atoms.

US 6,410,524 B1

COMBINATION THERAPY OF ANGIOTENSIN CONVERTING ENZYME INHIBITOR AND ALDOSTERONE ANTAGONIST FOR REDUCING MORBIDITY AND MORTALITY FROM CARDIOVASCULAR DISEASE

Alfonzo T. Perez, Lake Forest; Debra J. Asner, Morton Grove; Richard J. LaChapelle, Wilmette, all of Ill.; John C. Alexander, Princeton, N.J., and Barbara Roniker, Chicago, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Provisional application No. 60/107,398, filed on Nov. 6, 1998, Provisional application No. 60/122,977, filed on Mar. 5, 1999, Provisional application No. 60/122,978, filed on Mar. 5, 1999. This application Nov. 5, 1999, Appl. No. 434,685.

Int. Cl. A61K *31/585*

U.S. Cl. 514—175 **105 Claims**

1. A co-therapy method for treating a cardiovascular disorder in a subject comprising administering a first amount of an angiotensin converting enzyme inhibitor and a second amount of eplerenone to the subject, wherein the first amount and second amount together comprise a therapeutically effective amount of the inhibitor and eplerenone.

39. A co-therapy method for treating a cardiovascular disorder in a subject comprising administering a first amount of an angiotensin converting enzyme inhibitor, a second amount of a diuretic, and a third amount of eplerenone to the subject,

wherein the first, second and third amounts together comprise a therapeutically effective amount of the inhibitor, diuretic and eplerenone; and

wherein the diuretic has no substantial aldosterone antagonist effect.

US 6,410,525 B1

CARBAPENEM DERIVATIVES, UTILIZATION THEREOF AND INTERMEDIATE COMPOUNDS OF THE SAME

Hiroshi Matsui, Nara, Japan, assignor to Kyoto Pharmaceutical Industries, Ltd., Kyoto, Japan

PCT No. PCT/JP99/02301, § 371 Date Oct. 31, 2000, § 102(e) Date Oct. 31, 2000, PCT Pub. No. WO99/57121, PCT Pub. Date Nov. 11, 1999

PCT Filed Apr. 28, 1999, Appl. No. 674,363

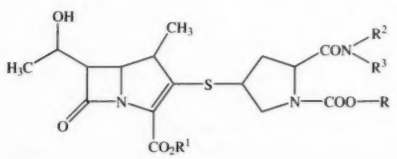
Claims priority, application Japan, May 1, 1998, 10-122499; Jul. 17, 1998, 10-203730

Int. Cl. C07D *477/20;* **A61K** *31/407;* **A61P** *31/04*

U.S. Cl. 514—210.13 **11 Claims**

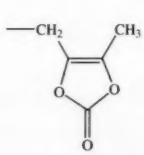
1. A carbapenem compound of the formula (I)

(I)



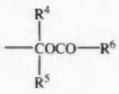
wherein R^1 is a group hydrolyzable in the living body, R^2 and R^3 are the same or different and each is a lower alkyl, R is a group of the formula (B)

(B)



or formula (C)

(C)



wherein R^4 and R^5 are the same or different and each is a hydrogen atom or a lower alkyl and R^6 is an alkyl having 1 to 10 carbon atoms.

US 6,410,526 B1

αV INTEGRIN RECEPTOR ANTAGONISTS

Mark E. Duggan, Schwenksville; George D. Hartman, Lansdale; Robert S. Meissner, Schwenksville, and James J. Perkins, Churchville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

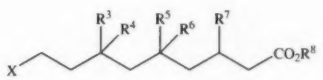
Provisional application No. 60/137,101, filed on Jun. 2, 1999, Provisional application No. 60/179,216, filed on Jan. 31, 2000. This application May 31, 2000, Appl. No. 583,522.

Int. Cl. A61K *31/55;* **C07D** *487/02;* **A61P** *19/10*

U.S. Cl. 514—212.02 **28 Claims**

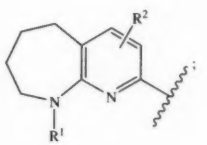
1. A compound of the Formula (I)

(I)



or a pharmaceutically acceptable salt thereof, wherein:

X is



R^1 is hydrogen or C_{1-3} alkyl and each non-aromatic ring carbon atom is unsubstituted or independently substituted with one or two R^2 substituents and each aromatic ring carbon atom is unsubstituted or independently substituted with one R^2 substituent selected from the group consisting of

halogen, C_{1-8} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloheteroalkyl, C_{3-8} cycloalkyl-C_{1-6} alkyl, C_{3-8} cycloheteroalkyl-C_{1-6} alkyl, aryl, aryl-C_{1-6} alkyl, amino, amino-C_{1-6} alkyl, C_{1-3} acylamino, C_{1-3} acylamino-C_{1-6} alkyl, $(C_{1-6}$ alkyl$)_{1-2}$ amino, C_{3-6} cycloalkyl-C_{0-2} alkylamino, $(C_{1-6}$ alkyl$)_{1-2}$ amino-C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-4} alkoxy-C_{1-6} alkyl, hydroxycarbonyl, hydroxycarbonyl-C_{1-6} alkyl, C_{1-3} alkoxycarbonyl, C_{1-3} alkoxycarbonyl-C_{1-6} alkyl, hydroxy, hydroxy-C_{1-6} alkyl, nitro, cyano, trifluoromethyl, trifluoromethoxy, trifluoroethoxy, C_{1-8} alkyl-$S(O)_{0-2}$, $(C_{1-8}$ alkyl$)_{0-2}$ aminocarbonyl, C_{1-8} alkyloxycarbonylamino, $(C_{1-8}$ alkyl$)_{1-2}$ aminocarbonyloxy, (aryl C_{1-3} alkyl$)_{1-2}$ amino, (aryl$)_{1-2}$ amino, aryl-C_{1-3} alkylsulfonylamino, and C_{1-8} alkylsulfonylamino;

or two R^2 substituents, when on the same non-aromatic carbon atom, are taken together with the carbon atom to which they are attached to form a carbonyl group;

R^3 and R^5 are each independently hydrogen, hydroxy, or C_{1-6} alkoxy;

R^4 and R^6 are each independently hydrogen or C_{1-3} alkyl; or

R^3 and R^4 taken together or R^5 and R^6 taken together are carbonyl oxygen, with the proviso that both R^3 and R^5 are not simultaneously hydrogen;

R^7 is aryl wherein the aryl group is selected from the group consisting of

(1) phenyl,
(2) naphthyl,
(3) pyridyl,
(4) furyl,
(5) thienyl,
(6) pyrrolyl,
(7) oxazolyl,
(8) thiazolyl,
(9) imidazolyl,
(10) pyrazolyl,
(11) isoxazolyl,
(12) isothiazolyl,
(13) pyrimidinyl,
(14) pyrazinyl,
(15) pyridazinyl,
(16) tetrazolyl,
(17) quinolyl,
(18) isoquinolyl,
(19) benzirnidazolyl,
(20) benzofuryl,
(21) benzothienyl,
(22) indolyl,
(23) benzthiazolyl,
(24) benzoxazolyl,
(25) dihydrobenzofuryl,
(26) benzo(1,3)dioxolanyl,
(27) benzo(1,4)dioxanyl,
(28) quinazolyl,
(29) quinoxalyl, and
(30) 3,4-dihydro-2H-1,4-dioxa-5-aza-naphthalenyl;

wherein the aryl group as defined above in items (1) to (30) is unsubstituted or substituted with one to three substituents independently selected from the group consisting of hydroxy, hydroxy-C_{1-6} alkyl, halogen, C_{1-8} alkyl, C_{3-8} cycloalkyl, aryl, aryl C_{1-3} alkyl, amino, amino C_{1-6} alkyl, C_{1-3} acylamino, C_{1-3} acylamino-C_{1-6} alkyl, C_{1-6} alkylamino, di(C_{1-6})alkylamino, C_{1-6} alkylamino-C_{1-6} alkyl, di(C_{1-6})alkylamino-C_{1-6} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{1-4} alkylsulfonyl, C_{1-4} alkylsulfonyl, C_{1-4} alkoxy-C_{1-6} alkyl, hydroxycarbonyl, hydroxycarbonyl-C_{1-6} alkyl, C_{1-5} alkoxycarbonyl, C_{1-3} alkoxycarbonyl-C_{1-6} alkyl, C_{1-5} alkylcarbonyloxy, cyano, trifluoromethyl, 1,1,1-trifluoroethyl, trifluoromethoxy, trifluoroethoxy, and nitro; or two adjacent substituents together with the carbon atoms to which they are attached join to form a five- or six-membered saturated or unsaturated ring containing 1 or 2 heteroatoms selected from the group consisting of N, O, and S, whose ring carbon atoms may be substituted with oxo or C_{1-3} alkyl; and

R^8 is hydrogen or C_{1-3} alkyl.

US 6,410,527 B1

METHOD OF TREATING OBSESSIVE COMPULSIVE DISORDERS, SOMATOFORM DISORDERS, DISSOCIATIVE DISORDERS, EATING DISORDERS, IMPULSE CONTROL DISORDERS, AND AUTISM

Vicki L. Coffin, Basking Ridge, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Provisional application No. 60/076,471, filed on Mar. 2, 1998. This application Mar. 1, 1999, Appl. No. 259,719.

Int. Cl. A61K *31/55;312/395;31/445;* **C07D** *223/14;491/04*

U.S. Cl. 514—217 **8 Claims**

1. A method for treating a human afflicted with a disorder selected from the group consisting of obsessive-compulsive disorder, somatoform disorders, dissociative disorders, eating disorders, impulse control disorders, and autism, said method comprising administering an effective amount of a D1/D5 antagonist wherein the D1/D5 antagonist is (−)-trans- 6,7,7a,8,9,13b-hexahydro-3-chloro-2-hydroxy-N-methyl-5-H-benzo[d]naphtho{ 2,1-b}azepine HCl.

US 6,410,528 B1

MORPHOLINO ETHERS

Jose M. Bueno; Jesus Chicharro Gonzalo; Jose-Miguel Coteron; Juan Carlos Cuevas; Jose M. Fiandor, and Araceli Mallo, all of Madrid, Spain, assignors to Glaxo Wellcome S.A., Madrid, Spain

PCT No. PCT/EP99/03139, § 371 Date Nov. 8, 2000, § 102(e) Date Nov. 8, 2000, PCT Pub. No. WO99/58512, PCT Pub. Date Nov. 18, 1999

PCT Filed May 7, 1999, Appl. No. 674,959

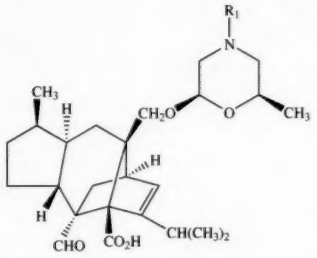
Claims priority, application European Pat. Off., May 11, 1998, 98500117

Int. Cl. A61K *31/5375;* **A61P** *33/00*

U.S. Cl. 514—230.8 **13 Claims**

1. A compound of formula (I)

(I)



and physiologically acceptable salts and or metabolically labile derivatives thereof, wherein R^1 represents C_{1-6} straight or branched chain alkyl, C_{1-6} straight or branched chain alkoxy, optionally substituted phenoxy, C_{3-6}straight or branched chain alkenyloxy (optionally substituted by 1 or 2 halogen atoms) or C_{1-4} straight or branched alkoxy substituted by an optionally substituted phenyl group, C_{3-8} straight or branched chain alkynyl, C_{3-6} straight or branched chain alkenyl (optionally substituted by C_{1-4}alkoxy or 1 or 2 halogen atoms), optionally substituted phenyl, optionally substituted C_{3-7} cycloalkyl, optionally substituted C_{5-7} cycloalkenyl, C_{2-4} straight or branched chain alkyl substituted by (C_{1-4} alkoxy, C_{1-4} alkyl thio or halogen), C_{1-4} straight or branched chain alkyl substituted by (C_{1-4} alkoxycarbonyl, arylalkyloxycarbonyl, aryloxycarbonyl, propadienyl, cyano, optionally substituted C_{3-7} cycloalkyl, optionally substituted 5 or 6 membered heteroaryl, or 1 or 2 optionally substituted phenyl groups), or methyl substituted by C_{1-6} alkanoyl or optionally substituted benzoyl; R_2 represents a group selected from hydrogen, C_{1-6} straight or branched chain alkyl, C_{3-6} straight or branched chain alkenyl, optionally substituted phenyl or C_{1-4} alkyl substituted with a group selected from C_{1-4}alkoxy, hydroxy, acyloxy, alkoxy carbonyl or aryloxycarbonyl, and R_3 represents a group selected from formyl or cyano.

US 6,410,529 B1

PHENYL UREA AND PHENYL THIOUREA DERIVATIVES AS HFGAN72 ANTAGONISTS

George Chan, Wynnewood, Pa.; Amanda Johns, Bishop's Stortford, United Kingdom; Anthony Jurewicz, Royersford, Pa.; Roderick Alan Porter, Ashwell, United Kingdom, and Katherine Widdowson, King of Prussia, Pa., assignors to SmithKline Beecham p.l.c., Brentford, United Kingdom

PCT No. PCT/GB98/02437, § 371 Date May 10, 2000, § 102(e) Date May 10, 2000, PCT Pub. No. WO99/09024, PCT Pub. Date Feb. 25, 1999

PCT Filed Aug. 13, 1998, Appl. No. 485,623

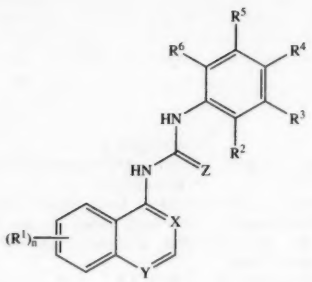
Claims priority, application United Kingdom, Aug. 14, 1997, 9717178; Apr. 8, 1998, 9807756

Int. Cl. C07D *217/00;215/00;* **A61K** *31/47*

U.S. Cl. 514—233.5 **12 Claims**

1. A compound of formula (I):

(I)



in which:

X and Y independently represent CH or nitrogen, provided that X and Y do not both represent CH;

Z represents oxygen or sulphur;

R^1 represents (C_{1-6})alkyl, (C_{2-6})alkenyl or (C_{1-6})alkoxy, any of which may be optionally substituted; halogen, R^7CO— or NR^8R^9CO—;

R^2, R^3, R^4, R^5 and R^6 independently represent (C_{1-6})alkyl, (C_{2-6})alkenyl, (C_{1-6})alkoxy or (C_{1-6})alkylthio, any of which may be optionally substituted; hydrogen, halogen, nitro, cyano, aryloxy, aryl(C_{1-6})alkyloxy, aryl(C_{1-6})alkyl, R^7CO—, R^7SO_2NH—, $R^7CON(R^{10})$—, NR^8R^9—, NR^8R^9CO—, —$COOR^8$ or heterocyclyl; provided that at least one of R^2, R^3, R^4, R^5 and R^6 is other than hydrogen;

or an adjacent pair of R^2, R^3, R^4, R^5 and R^6 together with the carbon atoms to which they are attached form an optionally substituted carbocyclic or heterocyclic ring;

R^7 is (C_{1-6})alkyl or aryl;

R^8 and R^9 independently represent hydrogen, (C_{1-6})alkyl, aryl or aryl(C_{1-6})alkyl;

R^{10} is hydrogen or (C_{1-6})alkyl; and

n is 0, 1, 2, 3 or 4;

or a pharmaceutically acceptable salt thereof;

provided that the compound is not:

a) N-1-isoquinolinyl-N'-(1-methyl-1H-indol-5-yl)urea;

b) N-(3-chloro-4-trifluoromethylphenyl)-N'-4-quinolinylurea;

c) N-(3-chloro-4-trifluoromethylphenyl)-N'-(5-nitro-4-quinolinyl)-urea;

d) N-(3,4,5-trimethoxyphenyl)-N'-(7-chloro-4-quinolinyl)urea;

e) N-(4-methoxyphenyl)-N'-(7-chloro-4-quinolinyl)urea; or

f) N-(4-chlorophenyl)-N'-(7-chloro-4-quinolinyl)urea.

US 6,410,530 B1

SUBSTITUTED 1,2,3,4-TETRAHYDRONAPHTHALENE DERIVATIVES

Stefan Berg, Ekerö; Lennart Florvall; Svante Ross, both of Södertälje, and Seth-Olov Thorberg, Strängnäs, all of Sweden, assignors to AstraZeneca AB, Sodertalje, Sweden

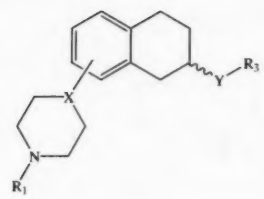
Division of application No. 08/836,004, filed as application No. PCT/SE97/00469, filed on Mar. 20, 1997, now Pat. No. 6,124,283. This application Aug. 31, 2000, Appl. No. 653,427. Claims priority, application Sweden, Mar. 22, 1996, 9601110

Int. Cl. A61K *31/535*

U.S. Cl. 514—235.5 **30 Claims**

1. A compound having the formula (I)

(I)



wherein

X is CH;

Y is NR_2CH_2, CH_2—NR_2, NR_2—CO, CO—NR_2 or NR_2SO_2;

R_1 is H, C_1–C_6 alkyl or C_3–C_6 cycloalkyl;

R_2 is H or C_1–C_6 alkyl;

R_3 is C_1–C_6 alkyl, C_3–C_6 cycloalkyl or $(CH_2)_n$— aromatic ring, wherein the aromatic ring is phenyl or a heteroaromatic ring containing one or two heteroatoms selected from N, O and S and wherein the aromatic ring may be mono- or di-substituted with R_4 and/or R_5;

R_4 is H, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, halogen, CN, CF_3, OH, C_1– C_6 alkoxy, NR_6R_7, OCF_3, SO_3CH_3, SO_3CF_3, $SO_2NR_6R_7$, phenyl, phenyl-C_1–C_6 alkyl, phenoxy, C_1–C_6 alkyl phenyl, C_1–C_6 alkyl-heterocyclic ring containing one or two heteroatoms or substituted heteroatoms selected from N, O, S, SO and SO_2, an optionally substituted heterocyclic or heteroaromatic ring containing one or two heteroatoms or substituted heteroatoms selected from N, O, S, SO and SO_2 wherein the optional substituent(s) may be selected from C_1–C_6 alkyl, C_3–C_6 cycloalkyl and phenyl-C_1–C_6 alkyl; or COR_8;

R_5 is H, OH, CF_3, OCF_3, halogen, C_1–C_6 alkyl or C_1–C_6 alkoxy;

R_6 is H, C_1–C_6 alkyl or C_3–C_6 cycloalkyl;

R_7 is H, C_1–C_6 alkyl or C_3–C_6 cycloalkyl;

R_8 is C_1–C_6 alkyl, C_3–C_6 cycloalkyl, CF_3, NR_6R_7, phenyl, or a heterocyclic ring containing one or two heteroatoms or substituted heteroatoms selected from N, O, S, SO and SO_2;

n is 0–4;

as (R)-enantiomer, (S)-enantiomer or a racemate in the form of the free base or a pharmaceutically acceptable salt or hydrate thereof.

US 6,410,531 B1

HEPATITIS C INHIBITOR TRI-PEPTIDES

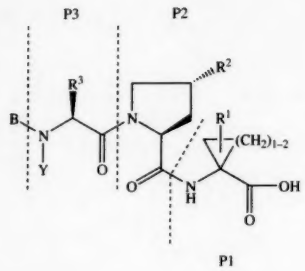
Montse Llinas-Brunet, D.D.O; Murray D. Bailey, Pierrefonds; Dale R. Cameron, Rosemere; Elise Ghiro, Laval; Nathalie Goudreau, Mont-Royal; Marc-Andre Poupart, Vimont; Jean Rancourt, Laval; Youla S. Tsantrizos, Saint-Laurent; Anne-Marie Faucher, Oka; Teddy Halmos, and Dominik M. Wernic, both of Laval, all of Canada, assignors to Boehringer Ingelheim (Canada) Ltd., Laval, Canada

Division of application No. 09/368,866, filed on Aug. 5, 1999, now Pat. No. 6,323,180, Provisional application No. 60/095,931, filed on Aug. 10, 1998, Provisional application No. 60/132,386, filed on May 4, 1999. This application May 4, 2001, Appl. No. 849,057.

Int. Cl. A61K *3/535;31/47;* **C07D** *413/00;215/16;401/00*

U.S. Cl. 514—235.5 **63 Claims**

1. The racemates, diastereoisomers or optical isomers of a compound of formula (I):



(I)

wherein

B is H, a C_6 or C_{10} aryl, C_{7-16} aralkyl; Het or (lower alkyl)-Het, all of which optionally substituted with C_{1-6} alkyl; C_{1-6} alkoxy; C_{1-6} alkanoyl; hydroxy; hydroxyalkyl; halo; haloalkyl; nitro; cyano; cyanoalkyl; amino optionally substituted with C_{1-6} alkyl; amido; or (lower alkyl)amide;

or B is an acyl derivative of formula R_4—C(O)—; a carboxyl derivative of formula R_4—O— C(O)—; an amide derivative of formula R_4—N(R_5)—C(O)—; a thioamide derivative of formula R_4—N(R_5)—C(S)—; or a sulfonyl derivative of formula R_4—SO_2 wherein R_4 is

(i) C_{1-10} alkyl optionally substituted with carboxyl, C_{1-6} alkanoyl, hydroxy, C_{1-6} alkoxy, amino optionally mono-or di-substituted with C_{1-6} alkyl, amido, or (lower alkyl) amide;

(ii) C_{3-7} cycloalkyl, C_{3-7} cycloalkoxy, or C_{4-10} alkylcycloalkyl, all optionally substituted with hydroxy, carboxyl, (C_{1-6} alkoxy)carbonyl, amino optionally mono-or di-substituted with C_{1-6} alkyl, amido, or (lower alkyl) amide;

(iii) amino optionally mono- or di-substituted with C_{1-6} alkyl; amido; or (lower alkyl)amide;

(iv) C_6 or C_{10} aryl or C_{7-16} aralkyl, all optionally substituted with C_{1-6} alkyl, hydroxy, amido, (lower alkyl)amide, or amino optionally mono-or di-substituted with C_{1-6} alkyl; or

(v) Het or (lower alkyl)-Het, both optionally substituted with C_{1-6} alkyl, hydroxy, amido, (lower alkyl) amide, or amino optionally mono-or di-substituted with C_{1-6} alkyl;

R_5 is H or C_{1-6} alkyl; with the proviso that when B is a carboxyl derivative, an amide derivative or a thioamide derivative, R_4 is not a cycloalkoxy;

Y is H or C_{1-6} alkyl;

R^3 is C_{1-8} alkyl, C_{3-7} cycloalkyl, or C_{4-10} alkylcycloalkyl, all optionally substituted with hydroxy, C_{1-6} alkoxy, C_{1-6} thioalkyl, amido, (lower alkyl)amido, C_6 or C_{10} aryl, or C_{7-16} aralkyl;

R^2 is CH_2—R_{20}, NH—R_{20}, O—R_{20} or S—R_{20}, wherein R_{20} is pyridinyl, quinolyl, (lower alkyl)-pyridinyl or (lower alkyl)-quinolyl, each optionally mono-, di- or tri-substituted with R_{21},

wherein each R_{21} is independently C_{1-6} alkyl; C_{1-6} alkoxy; lower thioalkyl; sulfonyl; NO_2; OH; SH; halo; haloalkyl; amino optionally mono-or di-substituted with C_{1-6} alkyl, C_6 or C_{10} aryl, C_{7-14} aralkyl, Het or (lower alkyl)-Het; amido optionally mono-substituted with C_{1-6} alkyl, C_6 or C_{10} aryl, C_{7-14} aralkyl, Het or (lower alkyl)-Het; carboxyl; carboxy(lower alkyl); C_6 or C_{10} aryl, C_{7-14} aralkyl or Het, said aryl, aralkyl or Het being optionally substituted with R_{22};

wherein R_{22} is C_{1-6} alkyl; C_{3-7} cycloalkyl; C_{1-6} alkoxy; amino optionally mono- or di-substituted with C_{1-6} alkyl; sulfonyl; (lower alkyl)sulfonyl; NO_2; OH; SH; halo; haloalkyl; carboxyl; amide; (lower alkyl)amide; or Het optionally substituted with C_{1-6} alkyl;

R^1 is H; C_{1-6} alkyl, C_{3-7} cycloalkyl, C_{2-6} alkenyl, or C_{2-6} alkynyl, all optionally substituted with halogen;

or a pharmaceutically acceptable salt or ester thereof;

wherein at least one "Het" group is present in the compound of formula (I) and "Het" is defined as a six- or seven-membered saturated or unsaturated aromatic or heterocycle containing from one to four heteroatoms selected from nitrogen, oxygen and sulfur, wherein said heterocycle is optionally fused to a benzene ring.

US 6,410,532 B2

SUBSTITUTED 1,2,3,4-TETRAHYDRONAPHTHALENE DERIVATIVES

Stefan Berg, Ekero; Mats Linderberg; Svante Ross, both of Södertälje; Seth-Olov Thorberg, Strängnäs, and Bengt Ulff, Södertälje, all of Sweden, assignors to AstraZeneca AB, Sodertalje, Sweden

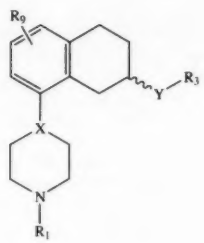
Division of application No. 09/171,577, filed as application No. PCT/SE98/01390, filed on Jul. 15, 1998, now Pat. No. 6,313,118. This application Jul. 10, 2001, Appl. No. 902,000. Claims priority, application Sweden, Jul. 25, 1997, 9702799

Int. Cl. C07D *295/135;295/155;211/26;* **A61K** *31/495;31/445*

U.S. Cl. 514—235.5 **22 Claims**

1. A compound of the formula I

(I)



wherein

X is CH;

Y is NR_2CH_2, CH_2—NR_2, NR_2—CO, CO—NR_2 or NR_2SO_2 wherein R_2 is H or C_1–C_6 alkyl;

R_1 is H, C_1–C_6 alkyl or C_3–C_6 cycloalkyl;

R_3 is C_1–C_6 alkyl, C_3–C_6 cycloalkyl or $(CH_2)_n$-aromatic ring, wherein the aromatic ring is phenyl or a heteroaromatic ring containing one or two heteroatoms selected from the group consisting of N, O and S and wherein the aromatic ring may be mono- or di-substituted with R_4 and/or R_5;

wherein R_4 is H, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, halogen, CN, CF_3, OH, C_1–C_6 alkoxy, NR_6R_7, OCF_3, SO_3CH_3, SO_3CF_3, $SO_2NR_6R_7$, phenyl-C_1–C_6 alkyl, phenoxy, C_1–C_6 alkyl phenyl, an optionally substituted heterocyclic ring containing one or two heteroatoms selected from the group consisting of N, O, S, SO and SO_2 wherein the substituent (s) is (are) selected from the group consisting of C_1–C_6 alkyl, C_3–C_6 cycloalkyl and phenyl-C_1–C_6 alkyl, an optionally substituted heteroaromatic ring containing one or two heteroatoms selected from the group consisting of N, O and S wherein the substituent (s) is (are) selected from the group consisting of C_1–C_6 alkyl, C_3–C_6 cycloalkyl and phenyl-C_1–C_6 alkyl, or COR_8;

wherein R_6 is H, C_1–C_6 alkyl or C_3–C_6 cycloalkyl; R_7 H, C_1–C_6 alkyl or C_3–C_6 cycloalkyl; and R_8 is C_1–C_6 alkyl, C_3–C_6 cycloalkyl, CF_3, NR_6R_7, phenyl, a heteroaromatic ring containing one or two heteroatoms selected from the group consisting of N, O and S or a heterocyclic ring containing one or two heteroatoms selected from the group consisting of N, O, S, SO and SO_2;

wherein R_5 is H, OH, CF_3, OCF_3, halogen, C_1–C_6 alkyl or C_1–C_6 alkoxy;

n is 0–4;

R_9 is C_1–C_6 alkyl, C_3–C_6 cycloalkyl, OCF_3, $OCHF_2$, OCH_2F, halogen, CN, CF_3, OH, C_1–C_6 alkoxy, C_1–C_6 alkoxy—C_1–C_6 alkyl, NR_6R_7, SO_3CH_3, SO_3CF_3, $SO_2NR_6R_7$, an unsubstituted or substituted heterocyclic or heteroaromatic ring containing

one or two heteroatoms selected from the group consisting of N, O and S, wherein the substituent (s) is (are) C_1–C_6 alkyl; or COR_8; wherein R_6, R_7 and R_8 are as defined above, wherein the compound is an (R)-enantiomer, an (S)-enantiomer, or a racemate in the form of a free base or a pharmaceutically acceptable salt or solvate thereof.

US 6,410,533 B1

ANTIBACTERIAL COMPOUNDS

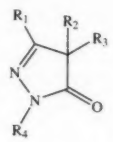
Bradford H. Hirth, Littleton; Andrew Janjigian, Cambridge, and Fred Vinick, Lexington, all of Mass., assignors to Genzyme Corporation, Cambridge, Mass.

Filed Feb. 10, 2000, Appl. No. 502,101

Int. Cl. A61K *31/4439;31/5355;* **C07D** *231/08;401/04*

U.S. Cl. 514—235.8 **23 Claims**

1. A compound of the formula



wherein

R_1 is substituted aryl, or substituted or unsubstituted heteroaryl;

R_2 and R_3 are each, independently, hydrogen; substituted or unsubstituted, linear, cyclic or branched alkyl; substituted or unsubstituted aminoalkyl; substituted or unsubstituted arylalkyl; substituted or unsubstituted heteroarylalkyl; or substituted or unsubstituted heteroarylcarbonyl; and

R_4 is a substituted or unsubstituted phenyl group, wherein

the aryl group represented by R_1 is substituted with one or more substitutents selected from methylenedioxo, aryl or heterocyclic; and the heteroaryl group represented by R_1 is selected from pyrimidyl, quinolyl, isoquinolyl, pyrrolyl, quinoxalyl, imidazolyl, oxazolyl, isoxazolyl, pyrazolyl, pyrazolyl, thiadiazolyl, oxadiazolyl, indazolyl, thiazolyl, isothiazolyl, tetrazolyl, benzo(b)thienyl, benzimidazolyl, benzoxazolyl, benzothiazolyl, benzothiadiazolyl, benzoxadiazolyl, indolyl, tetrahydroindolyl, azaindolyl, indazolyl, quinolinyl, imidazopyridyl, puryl, pyrrolo[2,3-d]pyrimidyl, pyrazolo[3,4-d]pyrimidyl).

US 6,410,534 B1

INHIBITORS OF PRENYL-PROTEIN TRANSFERASE

Christopher J. Dinsmore, Schwenksville; Ian M. Bell, Harleyville; Douglas C. Beshore, Lansdale, and Theresa M. Williams, Harleysville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

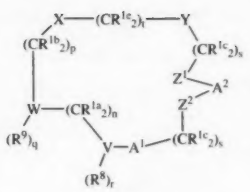
Provisional application No. 60/091,596, filed on Jul. 2, 1998. This application Jun. 29, 1999, Appl. No. 347,673.

Int. Cl. A61K *31/4188;* **A61P** *13/12;9/10;* **C07D** *487/08;498/08*

U.S. Cl. 514—249 **25 Claims**

1. A compound of the formula A:

A



wherein:

R^{1a}, R^{1b}, R^{1c}, R^{1d} and R^{1e} are independently selected from:

a) hydrogen,

b) unsubstituted or substituted aryl, unsubstituted or substituted heterocycle, cycloalkyl, alkenyl, alkynyl, $R^{10}O$—, $R^{11}S(O)_m$—, $R^{10}C(O)NR^{10}$—, $(R^{10})_2N$— C(O)—, CN, NO_2, $(R^{10})_2N$—C(NR^{10})—, $R^{10}C(O)$—, $R^{10}OC(O)$—, N_3, —$N(R^{10})_2$, or $R^{11}OC(O)NR^{10}$—,

c) unsubstituted or substituted C_1–C_6 alkyl wherein the substitutent on the substituted C_1–C_6 alkyl is selected from unsubstituted or substituted aryl, heterocyclic, cycloalkyl, alkenyl, alkynyl, perfluoroalkyl, halogen, $R^{10}O$—, $R^4S(O)_m$—, $R^4S(O)_2NR^{10}$—, $R^{10}C(O)NR^{10}$—, $(R^{10})_2N$—C(O)—, CN, $(R^{10})_2N$— C(NR^{10})—, $R^{10}C(O)$—, $R^{10}OC(O)$—, N_3, —$N(R^{10})_2$, and $R^{11}OC(O)$—NR^{10}—;

or two R^{1a}s, two R^{1b}s, two R^{1c}s, two R^{1d}s or two R^{1e}s, on the same carbon atom may be combined to form —$(CH_2)_v$—;

R^4 is selected from C_{1-4} alkyl, C_{3-6} cycloalkyl, heterocycle, aryl, unsubstituted or substituted with:

a) C_{1-4} alkoxy,

b) aryl or heterocycle,

c) halogen,

d) HO,

e)

f) —SO_2R^{11},

g) $N(R^{10})_2$, or

h) C_{1-4} perfluoroalkyl;

R^6 and R^7 are independently selected from:

1) hydrogen,

2) $R^{10}C(O)$—, or $R^{10}OC(O)$—, and

3) C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, C_{3-6} cycloalkyl, heterocycle, aryl, aroyl, heteroaroyl, arylsulfonyl, heteroarylsulfonyl, C_6–C_{10} multicyclic ring, unsubstituted or substituted with one or more substituents selected from:

a) $R^{10}O$—,

b) aryl or heterocycle,

c) halogen,

d) $R^{10}C(O)NR^{10}$—,

e)

f) —SO_2R^{11},

g) $N(R^{10})_2$,

h) C_{3-6} cycloalkyl,

i) C_6–C_{10} multicyclic ring,

j) C_1–C_6 perfluoroalkyl,

k) $(R^{10})_2N$—C(NR^{10})—,

l) $R^{10}OC(O)$—,

m) $R^{11}OC(O)NR^{10}$—,

n) CN, and

o) NO_2; or

R^6 and R^7 may be joined in a ring;

R^8 is independently selected from:

a) hydrogen,

b) unsubstituted or substituted aryl, unsubstituted or substituted heterocycle, C_3– C_{10} cycloalkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, perfluoroalkyl, F, Cl, Br, $R^{12}O$—, $R^{11}S(O)_m$—, $R^{10}C(O)NR^{10}$—, $(R^{10})_2NC(O)$—, $R^{10}{}_2N$—$C(NR^{10})$—, CN, NO_2, $R^{10}C(O)$—, $R^{10}OC(O)$—, N_3, —$N(R^{10})_2$, or $R^{11}OC(O)NR^{10}$—, and

c) C_1–C_6 alkyl unsubstituted or substituted by unsubstituted or substituted aryl, unsubstituted or substituted heterocycle, C_3–C_{10} cycloalkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, perfluoroalkyl, F, Cl, Br, $R^{10}O$—, $R^{11}S(O)_m$—, $R^{10}C(O)NH$—, $(R^{10})_2NC(O)$—, $R^{10}{}_2N$—$C(NR^{10})$—, CN, $R^{10}C(O)$—, $R^{10}OC(O)$—, N_3, —$N(R^{10})_2$, or $R^{10}OC(O)NH$—;

R^9 is selected from:

a) hydrogen,

b) C_2–C_6 alkenyl, C_2–C_6 alkynyl, perfluoroalkyl, F, Cl, Br, $R^{10}O$—, $R^{11}S(O)_m$—, $R^{10}C(O)NR^{10}$—, $(R^{10})_2NC(O)$—, $R^{10}{}_2N$—$C(NR^{10})$—, CN, NO_2, $R^{10}C(O)$—, $R^{10}OC(O)$—, N_3, —$N(R^{10})_2$, or $R^{11}OC(O)NR^{10}$—, and

c) C_1–C_6 alkyl unsubstituted or substituted by perfluoroalkyl, F, Cl, Br, $R^{10}O$—, $R^{11}S(O)_m$—, $R^{10}C(O)NR^{10}$—, $(R^{10})_2NC(O)$—, $R^{10}{}_2N$—$C(NR^{10})$—, CN, $R^{10}C(O)$—, $R^{10}OC(O)$—, N_3, —$N(R^{10})_2$, or $R^{11}C(O)NR^{10}$—;

R^{10} is independently selected from hydrogen, C_1–C_6 alkyl, unsubstituted or substituted benzyl, unsubstituted or substituted aryl and unsubstituted or substituted heterocycle;

R^{11} is independently selected from C_1–C_6 alkyl unsubstituted or substituted aryl and unsubstituted or substituted heterocycle;

R^{12} is independently selected from hydrogen, C_1–C_6 alkyl, C_1–C_3 perfluoroalkyl, unsubstituted or substituted benzyl, unsubstituted or substituted aryl, unsubstituted or substituted heterocycle, and C_1–C_6 alkyl substituted with unsubstituted or substituted aryl or unsubstituted or substituted heterocycle;

A^1 is selected from a bond and O;

A^2 is selected from a bond and O;

W is imidazolyl;

V is phenyl;

X and Y are independently selected from —C(O)—, —C(O)NR^{10}—, —NR^{10}C(O)—, —NR^{10}C(O)—O—, —O—C(O)NR^{10}—, —NR^{10}C(O)NR^{10}—, —C(O)NR^{10}-C(O)—, O, —$N(R^{10})$—, —$S(O)_2N(R^{10})$—, —$N(R^{10})S(O)_2$— and $S(O)_m$;

Z^1 is selected from unsubstituted or substituted phenyl and unsubstituted or substituted naphthyl, wherein the substituted phenyl or substituted naphthyl is substituted with one or more of:

1) C_{1-8} alkyl, C_{2-8} alkenyl or C_{2-8} alkynyl, unsubstituted or substituted with:
   a) C_{1-4} alkoxy,
   b) NR^6R^7,
   c) C_{3-6} cycloalkyl,
   d) aryl or heterocycle,
   e) HO,
   f) —$S(O)_mR^4$,
   g) —$C(O)NR^6R^7$,
   h) —$Si(C_{1-4}$ alkyl$)_3$, or
   i) C_{1-4} perfluoroalkyl;
2) substituted or unsubstituted aryl or substituted or unsubstituted heterocycle,
3) halogen,
4) OR^6,
5) NR^6R^7,
6) CN,
7) NO_2,
8) CF_3,
9) —$S(O)_mR^4$,
10) —$OS(O)_2R^4$,
11) —$C(O)NR^6R^7$,
12) —$C(O)OR^6$, or
13) C_3–C_6 cycloalkyl;

Z^2 is selected from a bond and unsubstituted or substituted phenyl wherein the substituted phenyl is substituted with one or more of:

1) C_{1-8} alkyl, C_{2-8} alkenyl or C_{2-8} alkynyl, unsubstituted or substituted with:
   a) C_{1-4} alkoxy,
   b) NR^6R^7,
   c) C_{3-6} cycloalkyl,
   d) aryl or heterocycle,
   e) HO,
   f) —$S(O)_mR^4$,
   g) —$C(O)NR^6R^7$,
   h) —$Si(C_{1-4}$ alkyl$)_3$, or
   i) C_{1-4} perfluoroalkyl;
2) substituted or unsubstituted aryl or substituted or unsubstituted heterocycle,
3) halogen,
4) OR^6,
5) NR^6R^7,
6) CN,
7) NO_2,
8) CF_3,
9) —$S(O)_mR^4$,
10) —$OS(O)_2R^4$,
11) —$C(O)NR^6R^7$,
12) —$C(O)OR^6$, or
13) C_3–C_6 cycloalkyl;

m is 0, 1 or 2;

n is 0, 1, 2, 3 or 4;

p is 0, 1, 2, 3 or 4;

q is 1 or 2;

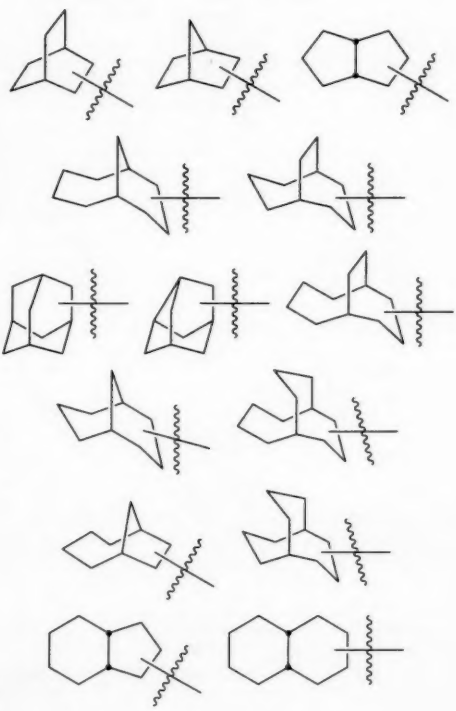
r is 0 to 5;

s is independently 0, 1, 2 or 3;

t is 1, 2, 3 or 4; and

v is 2 to 6;

C_6–C_{10} multicyclic ring is selected from:



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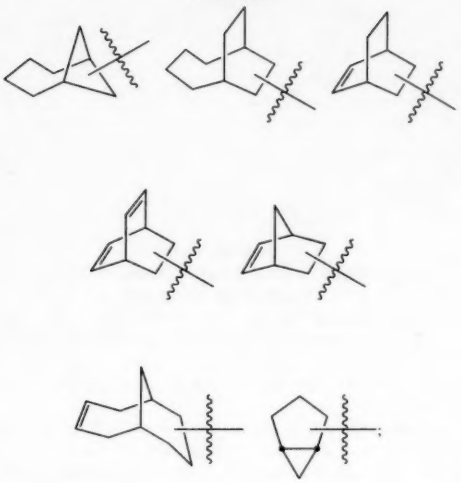


or a pharmaceutically acceptable salt or stereoisomer thereof.

US 6,410,535 B1

PROPHYLACTIC OR THERAPEUTIC AGENTS FOR DISEASES HAVING VASCULAR DYSFUNCTION ASSOCIATED WITH INSULIN RESISTANCE

Atsunori Kashiwagi; Kazuya Shinozaki; Yoshihiko Nishio; Tomio Okamura, all of Shiga-Ken; Noboru Toda, and Ryuichi Kikkawa, both of Osaka, all of Japan, assignors to Suntory Limited, Osaka, Japan

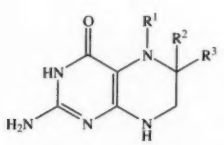
Continuation of application No. PCT/JP99/00917, filed on Feb. 25, 1999. This application Oct. 27, 1999, Appl. No. 427,579.

Claims priority, application Japan, Feb. 27, 1998, 10-047720

Int. Cl. A61K *31/495*

U.S. Cl. 514—249 **9 Claims**

1. A method for preventing or treating diseases having vascular dysfunction associated with insulin resistance, comprising administering to a patient in need thereof a pharmaceutical composition comprising a compound of the formula (I):



wherein R^1 and R^2each represents a hydrogen atom or taken together with each other represent a single bond, while R^3 represents —CH(OH)CH(OH)CH_3, —CH $(OCOCH_3)$CH-$(OCOCH_3)CH_3$, —CH_3, —CH_2OH or a phenyl group when R^1 and R^2 each represents a hydrogen atom, or —COCH(OH)CH_3 when R^1 and R^2together represents a single bond, or a pharmaceutically acceptable salt thereof.

US 6,410,536 B1

QUINOXALINONES AS SERINE PROTEASE INHIBITORS SUCH AS FACTOR XA AND THROMBIN

Danette Andrea Dudley, Ann Arbor, and Jeremy John Edmunds, Ypsilanti, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

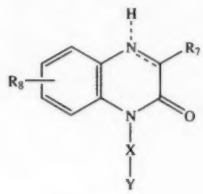
Provisional application No. 60/080,042, filed on Mar. 31, 1998. This application Aug. 3, 2000, Appl. No. 601,606.

Int. Cl. A61K *31/498;* **C07D** *241/44*

U.S. Cl. 514—249 **17 Claims**

1. A compound according to Formula V

V



or stereoisomers or pharmaceutically acceptable salts, esters, or amides thereof, wherein X, Y, R_7, R_8, and - - - are as follows:

X is selected from $(CH_2)_5$,
$(CH_2)_4$,
$(CH_2)_6$,
$CH_2C(=O)NHCH_2CH_2$,
$CH_2CH_2NHC(=O)CH_2$,
$(CH_2)_2NH(CH_2)_2$,
$(CH_2)_2O(CH_2)_2$,
C_6H_4,
$CH_2C_6H_4$,
$C_6H_4CH_2$,
C_6H_{10},
$CH_2C_6H_{10}$,
$C_6H_{10}CH_2$,
C_3H_8,
$CH_2C_5H_8$,
$C_5H_8CH_2$, and
$CH_2CH{=}CHCH_2CH_2$;

Y is selected from 2,6-dimethylpiperidinyl,
piperidinyl,
2,2,6,6-tetramethyl-piperidinyl-4-one,
(2-carboxy)piperidinyl,
(3-carboxy)piperidinyl,
(4-carboxy)piperidinyl,
3,5-dimethylpiperidinyl,
(4-hydroxy)piperidinyl,
(2-imino)piperidinyl,
piperidin-4-one-yl,
(2-dimethylaminomethyl)-piperidinyl,
(4-dimethylamino)-piperidinyl,
(4-sulphonyloxy)-piperidinyl,
(2-phenyl)piperidinyl,
2,5-dimethylpyrrolidinyl,
pyrrolidinyl,
(2-carboxy)pyrrolidinyl,
(3-N-acetyl-N-methyl)pyrrolidinyl,
(3-amino)pyrrolidinyl,
(2,5-bis-methoxymethyl)-pyrrolidinyl,
2-hydroxymethyl-pyrrolidinyl,
2-hydroxymethyl-5-methyl-pyrrolidinyl,
diisopropylamino,
dimethylamino,
diethylamino,
methylamino,
1-methyl-4,5-dihydro-1H-imidazol-2-yl,
2,5-dimethyl-1H-1-imidazolyl,
morpholinyl,
2,6-dimethylmorpholinyl,
piperazinyl,

2,6-dimethylpiperazinyl,
1H-pyrazolyl,
tetrahydro-1H-pyrazolyl, and
2,5-dimethyltetrahydro-1H-1-pyrazolyl;
R_7 is selected from (3-amidino)phenyl,
(3-hydroxy)phenyl,
[3-hydroxylamino(imino)methyl]-phenyl,
[3-hydrazino(imino)methyl]-phenyl,
(3-aminomethyl)phenyl,
(3-amino)phenyl,
(3-methylamino)phenyl,
(3-dimethylamino)phenyl,
(5-amidino-2-hydroxy)phenyl,
(1-amidino)piperid-3-yl,
(1-amidino)pyrrolid-3-yl,
(5-amidino)thien-2-yl,
(5-amidino)furan-2-yl,
pyridin-3-yl,
(4-amino)pyridin-3-yl,
(4-dimethylamino)pyridin-3-yl,
(6-amino)pyridin-2-yl,
(6-amidino)pyridin-2-yl,
(2-amino)pyridin-4-yl,
(2-amidino)pyridin-4-yl,
(3-amidino)benzyl,
(3-amino)benzyl,
(3-aminomethyl)benzyl,
(1-amidino)pyrrolid-3-ylmethyl,
(5-amidino)thien-2-ylmethyl,
(5-amidino)furan-2-ylmethyl,
(6-amidino)pyridin-2-ylmethyl,
(6-amino)pyridin-2-ylmethyl,
3-aminocyclohexyl,
3-amidinocyclohexyl,
3-aminocyclohexylmethyl,
3-amidinocyclohexylmethyl,
3-aminocyclopentyl,
3-amidinocyclopentyl,
3-aminocyclopentylmethyl, and
3-amidinocyclopentylmethyl; and
R_8 is selected from H,
Cl,
F,
SH,
SMe,
CF_3,
CH_3,
CO_2H,
CO_2Me,
CN,
$C(=NH)NH_2$,
C(=NH)NHOH,
$C(=NH)NHNH_2$,
$C(=O)NH_2$,
CH_2OH,
CH_2NH_2,
NO_2,
OH,
OMe,
OCH_2Ph,
OCH_2CO_2H,
$O(CH_2)_2CO_2H$,
$O(CH_2)_3CO_2H$,
$NHCH_2CO_2H$,
$NH(CH_2)_2CO_2H$,
$NH(CH_2)_3CO_2H$,
OCH_2CH_2OH,
OCH_2(1H-tetrazol-5-yl),
NH_2,
NHButyl,
NMe_2,
NHPh,
$NHCH_2Ph$,
NHC(=O)Me,
NHC(=O)c-Hexyl,
$NHC(=O)CH_2$c-Hexyl,
NHC(=O)Ph,
$NHC(=O)CH_2Ph$,
$NHS(=O)_2Me$,
$NHS(=O)_2$c-Hexyl,
$NHS(=O)_2CH_2$c-Hexyl,
$NHS(=O)_2Ph$, and
$NHS(=O)_2CH_2Ph$.

US 6,410,537 B1

COMPOSITIONS HAVING NEUROPROTECTIVE AND ANALGESIC ACTIVITY

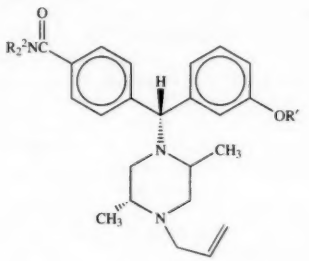
Frank C. Tortella, Columbia, Md.; Mark A. DeCoster, Metairie, La.; Kenner C. Rice, Bethesda, and Sylvia N. Calderon, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of application No. 09/009,307, filed on Jan. 20, 1998, which is a continuation-in-part of application No. 08/502,468, filed on Jul. 14, 1995, now abandoned, which is a continuation-in-part of application No. 08/302,431, filed on Sep. 9, 1994, now abandoned. This application Apr. 3, 2000, Appl. No. 541,431.

Int. Cl. A61K *31/395;31/495*

U.S. Cl. 514—250 **8 Claims**

1. A method of treating a mammal in need of analgesia comprising administration of an analgesic effective amount of an active agent having the formula:



wherein R^1 and R^2 are alkyl of 1–8 carbons, in a pharmaceutically acceptable carrier.

US 6,410,538 B2

BENZAMIDINE DERIVATIVES

Tadakiyo Nakagawa; Kazuyuki Sagi; Kaoru Yoshida; Yumiko Fukuda; Masataka Shoji; Shunji Takehana; Takashi Kayahara, and Akira Takahara, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of application No. PCT/JP99/03055, filed on Jun. 8, 1999. This application Dec. 8, 2000, Appl. No. 731,729.

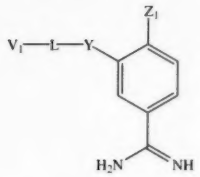
Claims priority, application Japan, Jun. 8, 1998, 10-159627; Jun. 8, 1998, 10-159628

Int. Cl. A61K *31/50;* **C01E** *25/16;* **C07D** *401/00;421/00;* **C07C** *257/00*

U.S. Cl. 514—252.01 **27 Claims**

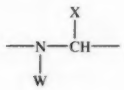
1. An benzamidine compound of the following formula (1-1) or pharmaceutically acceptable salt thereof:

(1-1)

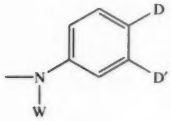


wherein L represents an organic group of any of the following formulae (2) to (5):

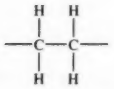
(2)



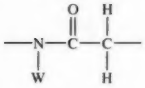
(3)



(4)



(5)



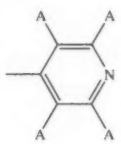
wherein W in formulae (2), (3) and (5) represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an aryl group having 4 to 10 carbon atoms or an aralkyl group having 5 to 12 carbon atoms, one of D and D' in formula (3) represents a bond to Y in general formula (1-1) and the other represents a hydrogen atom,

X in formula (2) represents a hydrogen atom, carboxyl group, an alkoxycarbonyl group having 1 to 3 carbon atoms, an alkyl group having 1 to 3 carbon atoms, which optionally has a substituent(s), or a benzyl group optionally has a substituent(s); the substituent(s) being selected from the group consisting of a carboxyl group, alkoxycarbonyl groups having 2 to 8 carbon atoms, alkylsulfonyloxy groups having 1 to 6 carbon atoms, piperidyloxy group, iminoalkylpiperidyloxy groups having 6 to 10 carbon atoms, alkoxycarbonylpiperidyloxy groups having 7 to 14 carbon atoms, piperidylalkyl groups having 6 to 8 carbon atoms, iminoalkylpiperidylalkyl groups having 7 to 11 carbon atoms, alkoxycarbonylpiperidylalkyl groups having 8 to 15 carbon atoms, pyrrolidinyloxy group, iminoalkylpyrrolidinyloxy groups having 5 to 9 carbon atoms, alkoxycarbonylpyrrolidinyloxy groups having 7 to 13 carbon atoms, amidino group, mono- or dialkylamidino groups having 2 to 7 carbon atoms, hydroxyl group, halogeno groups, indolyl group and alkyl groups having 1 to 3 carbon atoms, X and W in formula (2) may be bonded together to form a ring and, in this case, —W—X— represents an ethylene group, trimethylene group or tetramethylene group,

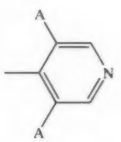
when L is an organic group of any of formulae (2) to (4), V_1 represents a hydrogen atom, benzoyl, benzenesulfonyl, 2-naphthalenesulfonyl, piperazinecarbonyl, cinnamoyl, piperidinecarbonyl, 4-methylthiazole-5-carbonyl, phenylacetyl, phenylthiocarbonyl or benzimidoyl group, optionally has a substituent(s), or an alkanesulfonyl group having 1 to 6 carbon atoms, which optionally has a substituent(s), and when L is an organic group of formula (5), V_1 represents an aryl group having 4 to 10 carbon atoms, optionally has a substituent(s),

when L is an organic group of any of formulae (2) to (5) and V_1 has a substituent(s), the substituent is selected from the group consisting of carboxyl group, alkoxycarbonyl groups having 2 to 7 carbon atoms, carbamoyl group, mono- or dialkylcarbamoyl groups having 2 to 7 carbon atoms, amidino group, mono-or dialkylamidino groups having 2 to 7 carbon atoms, acyl groups having 1 to 8 carbon atoms, halogeno groups, amino group, mono- or dialkylamino groups having 1 to 6 carbon atoms, arylamino groups having 4 to 6 carbon atoms, alkoxycarbonylamino groups having 2 to 7 carbon atoms, aminoalkyl groups having 1 to 3 carbon atoms, mono- or dialkylaminoalkyl groups having 2 to 7 carbon atoms, N-alkyl-N-alkoxycarbonylaminoalkyl groups having 4 to 10 carbon atoms, piperidyloxy group, iminoalkylpiperidyloxy groups having 6 to 10 carbon atoms, alkoxycarbonylpiperidyloxy groups having 8 to 14 carbon atoms, pyrrolidinyloxy group, iminoalkylpyrrolidinyloxy groups having 5 to 9 carbon atoms, alkoxycarbonylpyrrolidinyloxy groups having 7 to 13 carbon atoms, hydroxycarbonylalkyl groups having 2 to 7 carbon atoms, alkoxycarbonylalkyl groups having 3 to 8 carbon atoms, hydroxycarbonylalkenyl groups having 3 to 7 carbon atoms, alkoxycarbonylalkenyl groups having 4 to 8 carbon atoms, aryl groups having 4 to 10 carbon atoms, arylalkenyl groups having 6 to 12 carbon atoms, alkoxyl groups having 1 to 10 carbon atoms, nitro group, trifluoromethyl group, alkyl groups having 3 to 8 carbon atoms, arylsulfonyl groups having 4 to 10 carbon atoms, arylalkyl groups having 5 to 12 carbon atoms, piperazinecarbonyl group, iminoalkylpiperazinecarbonyl groups having 7 to 10 carbon atoms, piperazinesulfonyl group, iminoalkylpiperazinesulfonyl groups having 6 to 9 carbon atoms, piperidylalkyl groups having 6 to 9 carbon atoms, iminoalkylpiperidylalkyl groups having 8 to 12 carbon atoms, piperidylidenealkyl groups having 6 to 9 carbon atoms, iminoalkylpiperidylinealkyl groups having 8 to 12 carbon atoms, guanidino group, dialkylguanidino groups having 3 to 5 carbon atoms, phosphono group, dialkoxyphosphoryl groups having 2 to 9 carbon atoms, monoalkoxyhydroxyphosphoryl groups having 1 to 4 carbon atoms, trialkylamidino groups having 4 to 7 carbon atoms, dialkoxybenzoyl groups having 9 to 13 carbon atoms, 1-alkylpyridinio groups having 6 to 9 carbon atoms and groups of the following formulae:

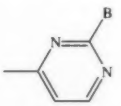
(6)



(7)



(8)



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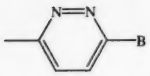
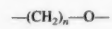
(9)

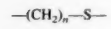


wherein A in formulae (6) and (7) represents a halogeno group, and B in formulae (8) and (9) represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, a halogeno group or amino group,

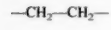
Y represents any of following formulae (10) to (16):



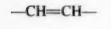
(10)



(11)

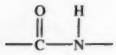


(12)

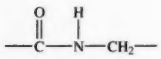


(13)

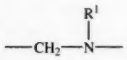
(14)



(15)



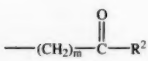
(16)



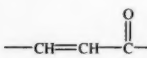
wherein n formulae (10) and (11) represents an integer of 0 to 2, R^1 in formula represents a hydrogen atom, a hydroxycarbonylalkyl group having 2 to 7 carbon atoms, an alkoxycarbonylalkyl group having 3 to 8 carbon atoms or a hydroxycarbonylalkenyl group having 3 to 7 carbon atoms,

Z_1 represents a group of any of following formulae (17) to (24):

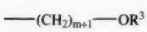
(17)



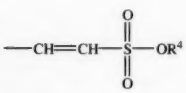
(18)



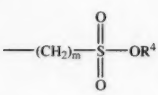
(19)



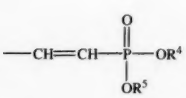
(20)



(21)



(22)



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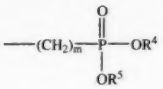
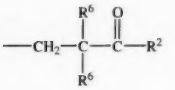
(23)



(24)



wherein m in formulae (17), (19), (21) and (23) represents an integer of 0 to 3, R^2 in formulae (17), (18) and (24) represents a hydroxyl group, an alkoxyl group having 1 to 5 carbon atoms, trifluoromethyl group, amino group or a mono- or dialkylamino group having 1 to 6 carbon atoms, R^3 in formula (19) represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms or acetyl group, R^4 in formulae (20) to (23) represents hydrogen atom or an alkyl group having 1 to 6 carbon atoms, R^5 in formulae (22) and (23) represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, and R^6 in formula (24) represents a halogeno group.

US 6,410,539 B1

IMIDAZOLE DERIVATIVES AND THEIR USE AS FARNESYL PROTEIN TRANSFERASE INHIBITORS

Jean-Claude Arnould, Reims, France, assignor to Astrazenca UK Limited, London, United Kingdom, and Zeneca Pharma SA, Cergy Cedex, France

PCT No. PCT/GB98/03115, § 371 Date Mar. 24, 2000, § 102(e) Date Mar. 24, 2000, PCT Pub. No. WO99/20612, PCT Pub. Date Apr. 29, 1999

PCT Filed Oct. 19, 1998, Appl. No. 509,476

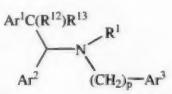
Claims priority, application European Pat. Off., Oct. 22, 1997, 97402503; Oct. 22, 1997, 97402504

Int. Cl. A61K *31/50;* **C07D** *401/00;421/00;277/20*

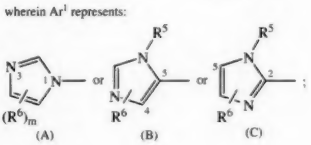
U.S. Cl. 514—252.05 **12 Claims**

1. A compound of Formula (1):

Formula (1)



wherein Ar^1 represents:



(A) (B) (C)

R^5 is hydrogen, C_{1-4}alkyl, phenylC_{1-4}alkyl;

R^6 is hydrogen, C_{1-4}alkyl, hydroxyC_{1-4}alkyl, haloC_{1-4}alkyl, dihaloC_{1-4}alkyl, C_{1-4}alkoxy, C_{1-4} alkoxyC_{1-4}alkyl, sulfanylC_{1-4}alkyl, aminoC_{1-4}alkyl, N—(C_{1-4}alkyl)aminoC_{1-4}alkyl, N,N-di-(C_{1-4}alkyl)aminoC_{1-4}alkyl or phenylC_{1-4}alkyl; m is 0, 1 or 2;

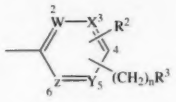
R^1 is hydrogen, C_{1-4}alkyl or C_{1-4}alkanoyl;

R^{12} and R^{13} are independently hydrogen or C_{1-4}alkyl;

Ar^2 is phenyl or heteroaryl;

p is 0 or 1;

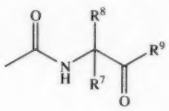
Ar^3 is of the formula:



wherein W, X, Y and Z are independently is CH or N, provided that at least two of W, X, Y and Z are CH and R^2 and $—(CH_2)_nR^3$ are attached to ring carbon atoms;

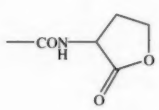
R^2 is a group of the Formula (2):

Formula (2)



wherein R^7 is hydrogen or C_{1-4}alkyl, R^8 is $—(CH_2)_q—R^{10}$ wherein q is 0–4 and R^{10} is C_{1-4} alkylsulfanyl, C_{1-4}alkylsulfinyl, C_{1-4}alkylsulfonyl, hydroxy, C_{1-4}alkoxy, carbamoyl, N—C_{1-4} alkylcarbamoyl, N,N-(diC_{1-4}alkyl)carbamoyl, C_{1-4}alkyl, phenyl, thienyl, or C_{1-4}alkanoylamino; R^9 is hydroxy, C_{1-6}alkoxy, C_{3-9}cycloalkyloxy, heterocyclyloxy, heterocyclylC_{1-4}alkoxy or $—NH—SO_2—R^{11}$ wherein R^{11} represents, trifluoromethyl, C_{1-4}alkyl, phenyl, heteroaryl, arylC_{1-4}alkyl or heteroarylC_{1-4}alkyl; or R^2 represents a lactone of Formula (3)

Formula (3)



the group of Formula (2) or (3) having L or D configuration at the chiral alpha carbon in the corresponding free amino acid;

n is 0, 1 or 2;

R^3 is phenyl or heteroaryl;

phenyl and heteroaryl rings in R^3, R^5, R^6, R^9, R^{11} and Ar^2 are independently optionally substituted on ring carbon atoms by up to three substituents selected from C_{1-4}alkyl, halogen, hydroxy, C_{1-4}alkoxy, C_{1-4}alkoxycarbonyl, C_{1-4}alkanoyl, C_{1-4}alkanoyloxy, amino, C_{1-4}alkylamino, di(C_{1-4}alkyl)amino, C_{1-4}alkanoylamino, nitro, cyano, carboxy, thiol, C_{1-4}alkylsulfanyl, C_{1-4}alkylsulfinyl, C_{1-4}alkylsulfonyl, C_{1-4}alkanesulphonamido, N-(C_{1-4}alkylsulphonyl)-N—C_{1-4}alkylamino, aminosulfonyl, N-(C_{1-4}alkyl)aminosulfonyl, N,N-di(C_{1-4}alkyl)aminosulfonyl, carbamoyl, N—(C_{1-4}alkyl)carbamoyl, N,N-(diC_{1-4}alkyl)carbamoyl, carbamoylC_{1-4}alkyl, N—(C_{1-4}alkyl)carbamnoylC_{1-4}alkyl, N,N-(diC_{1-4}alkyl)carbamoylC_{1-4}alkyl, hydroxyC_{1-4}alkyl and C_{1-4}alkoxyC_{1-4}alkyl and on ring NH groups by C_{1-4}alkyl, C_{1-4}alkanoyl, C_{1-4}alkylsulfonyl, haloC_{1-4}alkyl, difluoromethyl or trifluoromethyl;

wherein, in each of Ar^2, R^2 and R^3, each said heterocyclyl group is a 5- or 6-membered monocyclic ring containing 1 to 3 heteroatoms selected from nitrogen, oxygen and sulfur;

and each said heteroaryl group is a 5–10 membered monocyclic heteroaryl ring containing up to 3 heteroatoms selected from nitrogen, oxygen and sulphur;

provided that:

when n is 0, Ar^3 is substituted by R^2 in the 4-position and $—(CH_2)_nR^3$ in the 3- or 5-position; and when n is 1 or 2, Ar^3 is substituted by R^2 in the 3- or 5-position and $—(CH_2)_nR^3$ in the 4-position;

or a pharmaceutically acceptable salt, prodrug or solvate thereof.

US 6,410,540 B1

INHIBITORS OF P38-α KINASE

R. Richard Goehring, Pipersville, Pa.; Gregory R. Luedtke, Sunnyvale, Calif.; Babu J. Mavunkel, Sunnyvale, Calif.; Sarvajit Chakravarty, Sunnyvale, Calif.; Sundeep Dugar, Bridgewater, N.J.; George F. Schreiner, Los Altos Hills, Calif.; David Y. Liu, Palo Alto, Calif., and John A. Lewicki, Los Gatos, Calif., assignors to Scios, Inc., Sunnyvale, Calif.

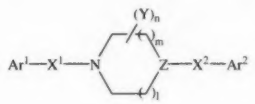
Provisional application No. 60/125,343, filed on Mar. 19, 1999, Provisional application No. 60/098,219, filed on Aug. 28, 1998. This application Aug. 27, 1999, Appl. No. 385,494.

Int. Cl. A61K *31/50;31/495;31/445*

U.S. Cl. 514—252.13 25 Claims

1. A method to treat a condition mediated by p38α kinase which method comprises administering to a subject in need of such treatment a compound of the formula:

(1)



and the pharmaceutically acceptable salts thereof, or a pharmaceutical composition thereof,

wherein

Z is N or CR^1,

wherein R^1 is selected from the group consisting of optionally substituted alkyl, alkoxy, aryl, arylalkyl, aryloxy, heteroaryl, amino, ureayl, carbamate, polyhaloalkoxy, halogen, acyl, carboxy, and hydroxy,

each of X^1 and X^2 is a linker,

wherein each said linker is independently saturated or unsaturated alkylene optionally containing 1–4 carbonyl, 1–4 SO_2, and/or 1–3 heteroatoms, including a linker which is itself CO, SO_2, SO or is itself a heteroatom, and said alkylene or suitable heteroatom optionally substituted with a substituent selected from the group consisting of halo, alkyl, alkoxy, cycloalkyl, aryl, aryloxy, arylalkyl, haloalkyl, polyhaloalkyl, haloalkoxy, polyhaloalkoxy, cycloheteroalkyl, cycloheteroalkylalkyl, heteroaryl, heteroarylalkyl, heteroaryloxy, arylthio, arylsulfinyl, arylsulfonyl, heteroarylthio, heteroarylsulfinyl, heteroarylsulfonyl, alkylaminocarbonyl, arylaminocarbonyl, heteroarylaminocarbonyl, alkoxycarbonyl, aryloxycarbonyl, heteroaryloxycarbonyl, acyl, aminocarbonyl, arylcarbonyl, heteroarylcarbonyl, cyano, carboxy, hydroxy, tetrazolyl, imidazole, oxazole, triazole, and —SOR wherein R is hydroxy, alkyl, aryl, alkoxy, aryloxy, cycloalkyl, heteroaryl, heteroarylalkyl, heteroaryloxy, heteroarylalkoxy and cycloheteroalkylalkoxy,

Ar^1 and Ar^2 are identical or different, and represent optionally substituted aryl groups containing one or more rings optionally including one or more heteroatoms, selected from the group of O, N and S;

wherein Ar^1 and Ar^2 do not comprise an optionally substituted indolyl substituent; and

with the proviso that when X^2 is CH_2 or an isostere thereof, X^1 is CO or an isostere thereof, and Ar^2 is optionally substituted phenyl, Ar^1 is other than benzimidazolyl or benzotriazolyl;

wherein Y is selected from the group consisting of optionally substituted alkyl, alkoxy, cycloalkyl, cycloheteroalkyl, aryl, cycloheteroalkyl, heteroaryl, halogen, alkylaminocarbonyl, arlyaminocarbonyl, heteroarylaminocarbonyl, acyl, carboxy, hydroxy, aminocarbonyl, arylcarbonyl, heteroarylcarbonyl, cyano, amino, and alkylamino,

wherein n is an integer from 0–4, and

wherein m is an integer from 0–4 and l is an integer from 0–3.

US 6,410,541 B2

COMPOUNDS USEFUL FOR INHIBITION OF FARNESYL PROTEIN TRANSFERASE

Stacy W. Remiszewski, Washington Township; Ronald J. Doll, Maplewood; Carmen Alvarez, Roselle Park, and Tarik Lalwani, Edison, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

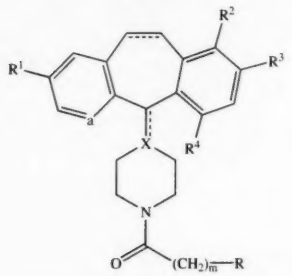
Division of application No. 09/094,720, filed on Jun. 15, 1998, now Pat. No. 6,211,193, Provisional application No. 60/049,953, filed on Jun. 17, 1997. This application Jan. 24, 2001, Appl. No. 768,918.

Int. Cl. A61K *31/496;* **C07D** *401/04;* **A61P** *35/00*

U.S. Cl. 514—253.03 **9 Claims**

1. A compound of the formula:

(1.0)



or a pharmaceutically acceptable salt or solvate thereof, wherein:

(A) a represents N or NO^-;

(B) R^1, R^3 and R^4 are the same or different halo atom, and R^2 is H; or

(C) R^1, R^2 and R^3 are the same or different halo atom, and R^4 is H; and

(D) the dotted line (— — —) represents an optional bond;

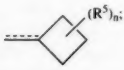
(E) X is N and the optional bond to X is absent;

(F) m is 1 or 2;

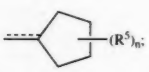
(G) R represents:

1. a cycloalkyl ring selected from:

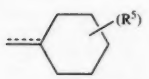
2.0



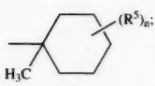
3.0



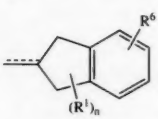
4.0



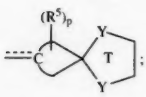
5.0



6.0



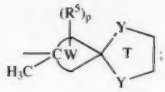
7.0



or

-continued

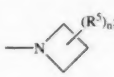
8.0



or

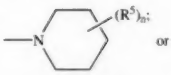
2. a heterocycloalkyl ring selected from:

9.0



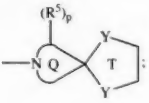
10.0

11.0



or

12.0



(H) p is 0, 1 or 2;

(I) when n or p is 1 then R^5 is selected from:

(1) =O, with the proviso that when R is heterocycloalkyl Ring 10.0 and m is 0, 1 or 2 then the =O group is not bound to a carbon that is adjacent to the ring nitrogen, and with the proviso that when R is heterocycloalkyl Ring 11.0 and m is 1 or 2 then the =O group is not bound to a carbon that is adjacent to the ring nitrogen;

(2) =N—OH;

(3) =N—OR^7 wherein R^7 represents a C_1 to C_6 alkyl group;

(4) =N—N(H)—C(O)—R^8 wherein R^8 represents —NH_2 or C_1 to C_6 alkyl;

(5) =N—O—$(CH_2)_r$—C(O)—R^{11} wherein r is 1, 2, or 3, and R^{11} is selected from: —OH, —O—alkyl or —NH^2;

(6) =N—O—$(CH_2)_s$—O—R^{12}, wherein s is 2, 3, or 4 and R^{12} is selected from: H, alkyl or trialkylsilyl (e.g., $Si(CH_3)_2$—$C(CH_3)_3$);

(7) —$NR^{13}R^{14}$ wherein R^{13} and R^{14} are independently selected from:

(a) H;

(b) acyl;

(c) alkyl;

(d) aralkyl;

(d) cycloalkyl;

(e) heterocycloalkyl;

(f) heteroaralkyl

(g) —$S(O)_2R^{15}$ wherein R^{15} is C_1 to C_6 alkyl or aryl; or

(h) an aralkyl, cycloakyl, heterocycloalkyl, heteroaryl or heteroaralkyl having from 1 to 3 substituents selected from: =O, halo, —OH or —O—alkyl, wherein said substituents being bound to substitute ring carbons;

(8) OR^{16} wherein R^{16} is selected from:

(a) H;

(b) C_1 to C_6 alkyl;

(c) —C(O)R^{17} wherein R^{17} is selected from: alkyl, aryl, heteroaryl or aralkyl; or

(d) —C(O)NHR^{18} wherein R^{18} is selected from: H, —C(O)R^{19} wherein R^{19} *is selected from:* —$C(CI)_3$, alkyl or —$(CH_2)_2OH$;

(J) when n or p is 2, then each R^5 is the same or different and each R^5 is selected from:

(1) —$NR^{13}R^{14}$ wherein R^{13} and R^{14} are independently selected from:

(a) H;

(b) acyl;
(c) alkyl;
(d) aralkyl;
(d) cycloalkyl;
(e) heterocycloalkyl;
(f) heteroaralkyl
(g) $—S(O)_2R^{15}$ wherein R^{15} is C_1 to C_6 alkyl or aryl; or
(h) an aralkyl, cycloalkyl, heterocycloalkyl, heteroaryl or heteralkyl having from 1 to 3 substituents selected from: =O, halo, —OH or —O—alkyl, wherein said substituents being bound to substitutable ring carbons; or;
(2) OR^{16} wherein R^{16} is selected from:
(a) H;
(b) C_1 to C_6 alkyl;
(c) $—C(O)R^{17}$ wherein R^{17} is selected from: alkyl, aryl, heteroaryl or aralkyl; or
(d) $—C(O)NHR^{18}$ wherein R^{18} is selected from: H, $—C(O)R^{19}$ wherein R^{19} is selected from: $—C(Cl)_3$, alkyl or $—(CH_2)_2OH$; or

(K) provided that R^5 is not bound to a carbon atom adjacent to the nitrogen atom in Rings 9.0, 10.0, 11.0, or 12.0;
(L) Y is selected from O or S, provided that each Y is the same;
(M) Z represents the remainder of cycloalkyl Rings 2.0, 3.0 or 4.0, such that spiro ring T is bound to one of the carbon atoms in said cycloalkyl ring;
(N) W represents the remainder of cycloalkyl Ring 5.0, such that spiro ring T is bound to one of the carbon atoms in said cycloalkyl ring:
(O) Q represents the remainder of heterocycloalkyl Rings 9.0, 10.0 or 11.0, such that spiro ring T is bound to one of the carbon atoms in said heterocycloalkyl ring, provided that spiro Ring T is not bound to a carbon atom adjacent to the nitrogen atom;
(P) R^6 is selected from: alkoxy, alkyl or —OH; and
(Q) n is 1 or 2.

US 6,410,542 B1

AMINOTETRAZOLE DERIVATIVES USEFUL AS NITRIC OXIDE SYNTHASE INHIBITORS

E. Ann Hallinan, Evanston; Donald W. Hansen, Jr., Skokie, and Sofya Tsymbalov, Des Plaines., all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

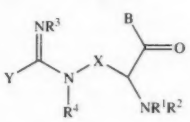
Continuation of application No. 09/267,266, filed on Mar. 12, 1999, now Pat. No. 6,169,089, which is a continuation of application No. 09/166,036, filed on Oct. 5, 1998, now Pat. No. 5,919,787, which is a continuation of application No. 08/817,971, filed on Apr. 30, 1997, now Pat. No. 5,854,251, which is a continuation of application No. PCT/US95/14001, filed on Nov. 8, 1995, which is a continuation-in-part of application No. 08/336,596, filed on Nov. 9, 1994, now Pat. No. 5,684,008. This application Oct. 13, 2000, Appl. No. 687,350.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *31/41;31/415;* **C07D** *257/06;231/40*

U.S. Cl. 514—256 **6 Claims**

1. A compound having the formula;



or a pharmaceutically acceptable salt thereof; wherein;

R^1, R^2 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and lower alkynyl;

R^3, R^4 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkynyl, OR^6 where R^6 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, aryl, COR^7, or SO_2R^8 where R^7 and R^8 are independently selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl and aryl;

X is selected from the group consisting of lower alkylene, lower alkenylene, and lower alkynylene, all of which may be optionally substituted with lower alkyl, lower alkoxy, hydroxy, halogen, trifluoromethyl, nitro, cyano, amino;

$—(CH)_p Q(CH_2)_r—$ where p is 1 to 3, r is 1 to 3 and Q is oxygen, C=O, $S(O)_t$ where t is 0 to 2, or NR^{12} where R^{12} is hydrogen or lower alkyl which may be optionally substituted with lower alkyl, lower alkoxy, hydroxy, halogen, trifluoromethyl, nitro, cyano, amnino; or

$—(CH_2)_s A(CH_2)_v—$ where s is O to 2, v is 0 to 2 and A is a 3 to 6 membered carbocyclic radical which may be optionally substituted with lower alkyl, lower alkoxy, hydroxy, halogen, trifluoromethyl, nitro, cyano, amino wherein all said radicals are optionally substituted with hydrogen, halogen and lower alkyl;

Y is selected from the group consisting of lower alkyl, lower alkenyl, and lower alkynyl or Y may be NR^9R^{10} wherein R^9 and R^{10} are independently selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkynyl, nitro, amino, aryl, and lower alkaryl; and

B is NR^5R^{11} wherein R^5 is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkynyl and aryl, and R^{11} is selected from a 3 to 8 member heterocyclyl radical in which at least one member of the ring is carbon and in which 1 to about 4 members are heteroatoms independently selected from oxygen, nitrogen and sulfur and said heterocyclyl radical may be optionally substituted with hydroxyl, lower alkoxy, lower alkyl, halogen, nitro, carboxyl, SO_2R^{13} where R^{13} is selected from lower alkyl, lower alkoxy, NR^1R^2, amino, acyloxy, trifluoromethyl, phenyl and naphthyl which may be optionally substituted with halogen, nitro, lower alkoxy, and lower alkyl.

US 6,410,543 B1

METHOD OF PRODUCING A CONCENTRATE COMPRISING A SULFONAMIDE IN SOLUTION, A 2,4-DIAMINOPYRIMIDINE IN STABLE SUSPENSION WITHIN SAID SOLUTION

Michael A. Strobel, Northfield, and William A. Soderlund, Jr., St. Peter, both of Minn., assignors to Pharmaceutical Solutions, Inc., Northfield, Minn.

Continuation of application No. 09/304,954, filed on May 5, 1999, now Pat. No. 6,211,185. This application Feb. 12, 2001, Appl. No. 780,371.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *31/505;31/18*

U.S. Cl. 514—256 **20 Claims**

1. A method of producing a palatable antimicrobial drug concentrate, that may be orally administered to an animal in combination with its drinking water, comprising the following steps:

a) preparing a mixture of an antioxidant, a base, a pharmaceutically acceptable surfactant, a sweetener, and a flavoring agent in solution;
b) stirring until the mixture is dissolved;
c) adding a sulfonamide to the solution
d) stirring and dissolving the sulfonamide;
e) adding an antimicrobial agent to the solution; and
f) stirring the solution sufficient enough to suspend the antimicrobial agent.

US 6,410,544 B1

CHOLINERGIC AGENTS IN THE TREATMENT OF PRESBYOPIA

Arlene Gwon, Newport Beach, and Elizabeth WoldeMussie, Laguna Niguel, both of Calif., assignors to Allergan Sales, Inc., Irvine, Calif.

Continuation-in-part of application No. 09/126,064, filed on Jul. 30, 1998, now Pat. No. 6,291,466. This application Apr. 25, 2001, Appl. No. 842,299.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *31/505*

U.S. Cl. 514—256 13 Claims

1. A method for increasing or decreasing parasympathetic/cholinergic/ciliary tonic contraction in order to restore the resting position of the eye and allow normal positive and negative accommodation for both myopic presbyopes and hyperopic presbyopes, said method comprising administering to a presbyope an effective amount of from 0.001% to less than 2% by weight/volume of pilocarpine for effecting a net response in the parasympathetic system of ciliary muscle components.

US 6,410,545 B2

LIPID LOWERING QUINAZOLINE DIETARY SUPPLEMENT COMPOSITION

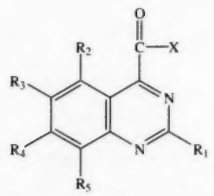
Fatih M. Uckun, White Bear Lake; Vuong N. Trieu, Roseville, and Xing-Ping Liu, Minneapolis, all of Minn., assignors to Parker Hughes Institute, St. Paul, Minn.

Continuation of application No. 09/756,483, filed on Jan. 8, 2001, now Pat. No. 6,355,645, which is a continuation of application No. 09/126,940, filed on Jul. 30, 1998, now Pat. No. 6,172,071. This application Jun. 26, 2001, Appl. No. 892,047.

Int. Cl. A61K *3/505*

U.S. Cl. 514—260 3 Claims

1. A dietary supplement composition comprising: a compound of the formula:



wherein X comprises a straight or branched chain or cyclic alkyl, or an aromatic ring structure, and wherein each of R_1–R_5 are independently selected from H, OH, NH_2, SH, alkyl, alkoxy, and acyloxy; and

and acceptable nutrients.

US 6,410,546 B1

USE OF MKC-442 IN COMBINATION WITH OTHER ANTIVIRAL AGENTS

Phillip A. Furman; Cary P. Moxham, both of Durham; David W. Barry, Chapel Hill, and Katyna Borroto-Esoda, Raleigh, all of N.C., assignors to Triangle Pharmaceuticals, Inc., Durham, N.C.

Provisional application No. 60/041,909, filed on Apr. 7, 1997. This application Apr. 7, 1998, Appl. No. 56,548.

Int. Cl. A01N *43/54;43/90*

U.S. Cl. 514—274 8 Claims

1. A method for the treatment of a patient infected with HIV, comprising administering an effective treatment amount of MKC-442 or its pharmaceutically acceptable salt in combination or alternation with a compound selected from the group consisting of abacavir, FTC or d4T or its pharmaceutically acceptable salt.

US 6,410,547 B1

PHENYLPYRIDINE DERIVATIVES USEFUL AS PHOSPHODIESTERASE INHIBITORS

Paul W. Manley, Arlesheim, Switzerland, assignor to Novartis AG, Basel, Switzerland

Division of application No. 09/655,668, filed on Sep. 6, 2000, now Pat. No. 6,288,092, which is a continuation of application No. 09/559,520, filed on Apr. 27, 2000, now Pat. No. 6,258,843, which is a division of application No. 09/142,099, filed as application No. PCT/EP97/01157, filed on Mar. 7, 1997, now Pat. No. 6,090,817. This application Jul. 25, 2001, Appl. No. 915,047.

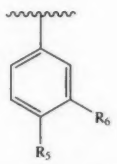
Claims priority, application United Kingdom, Mar. 8, 1996, 9604926

Int. Cl. A61K *31/4418;* C07D *213/26;221/16*

U.S. Cl. 514—277 13 Claims

1. A (4-oxy-3-(aryl)phenyl)-azaryl compound in free or pharmaceutically acceptable acid addition salt form, wherein aryl in (aryl)phenyl is (a) a phenyl moiety of formula II

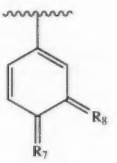
II



wherein R_5 and R_6 are, independently, H, nitro, halo, trifluoromethyl, C_{1-4}alkoxy, cyano, or phenoxy;

or (b) an aromatic 2,5-cyclohexadien-3,4-ylidine-1-yl moiety of formula III

III



wherein R_7 and R_8 together form an aromatic bridge of 3–5 carbon atoms in length.

US 6,410,548 B2

SPIROPIPERIDINE DERIVATIVES AS MELANOCORTIN RECEPTOR AGONISTS

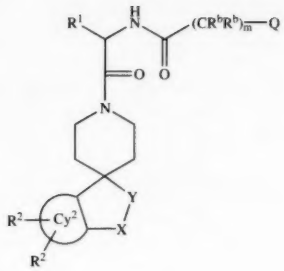
Ravi P. Nargund, East Brunswick; Zhixiong Ye, Lawrenceville; Brenda L. Palucki, Belle Mead; Raman K. Bakshi, Edison; Arthur A. Patchett, Westfield, and Leonardus H. T. Van Der Ploeg, Scotchplains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of application No. 09/329,814, filed on Jun. 10, 1999, Provisional application No. 60/123,260, filed on Mar. 8, 1999, Provisional application No. 60/088,908, filed on Jun. 11, 1998. This application Feb. 12, 2001, Appl. No. 781,373.

Int. Cl. A61K *31/438;* C07D *209/96*

U.S. Cl. 514—278 11 Claims

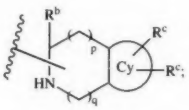
1. A compound having the formula I:



wherein

Cy^2 is benzene or cyclohexane;

Q is



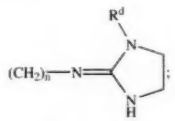
X is NR^b, NSO_2R^a, $NSO_2N(R^b)_2$, $NCOR^a$, or $NCON(R^b)_2$;

Y is $(CH_2)_r$, CH—C_{1-8}alkyl, or C═O;

R^1 is H, C_{1-8}alkyl, $CH(R^b)$-aryl, or $(CH_2)_n$—C_{5-6}cycloalkyl in which aryl is optionally substituted by one or two R^c groups;

R^2 is H or halo;

R^a is R^b, $(CH_2)_nN(R^b)_2$, $(CH_2)_nN(R^b)C(=NR^d)NR^b$, $(CH_2)_n$NH-2-pyridyl, $(CH_2)_n$NH-2-imidazolyl, $(CH_2)_n$NH-2-thiazolyl, or



R^b is H, C_{1-8}alkyl, $(CH_2)_n$aryl, C_{3-6}cycloalkyl; or 2 R^b together with the nitrogen atom to which they are attached form a 5- or 6-membered ring optionally containing an additional heteroatom selected from O, S, and NR^1;

R^c is R^b, halo, OR^b, $NHSO_2R^b$, $N(R^b)_2$, CN, NO_2, $SO_2N(R^b)_2$, SO_2R^b, CF_3, OCF_3;

or two R^c groups attached to adjacent carbon atoms together form methylenedioxy;

R^d is H, NO_2, or CN;

Cy is pyridine;

n is 0 to 3;

m, p and q are independently 0, 1 or 2;

r is 1, 2 or 3;

or a pharmaceutically acceptable salt thereof.

US 6,410,549 B1

METHOD OF TREATING THE SYNDROME OF CORONARY HEART DISEASE RISK FACTORS IN HUMANS

Anton H. Clemens, Madison, Wis., assignor to CPD, LLC, Madison, Wis.

Continuation-in-part of application No. 09/639,061, filed on Aug. 15, 2000, now Pat. No. 6,262,062. This application Jun. 11, 2001, Appl. No. 878,834.

Int. Cl. A61K *31/44*

U.S. Cl. 514—282 **55 Claims**

1. A method of treating a human suffering from one or more conditions included within Coronary Heart Disease Risk Factor (CHDRF) syndrome, the method comprising administering, by a pharmaceutically effective mode, a drug composition comprising:

an opioidergic agent; and

an insulin secretagogue.

US 6,410,550 B1

ARYL FUSED AZAPOLYCYCLIC COMPOUNDS

Jotham Wadsworth Coe, Niantic, and Paige Roanne Palmer Brooks, North Stonington, both of Conn., assignors to Pfizer INC, New York, N.Y.

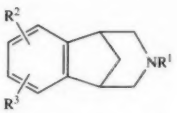
PCT No. PCT/IB98/01813, § 371 Date Sep. 28, 1999, § 102(e) Date Sep. 28, 1999, PCT Pub. No. WO99/35131, PCT Pub. Date Jul. 15, 1999

Provisional application No. 60/070,245, filed on Dec. 31, 1997. This PCT application Nov. 13, 1998, Appl. No. 402,010.

Int. Cl. A61K *31/44;31/505;* **C07D** *221/22;413/00;* **A61P** *1/00*

U.S. Cl. 514—289 **15 Claims**

1. A compound of the formula



(I)

R^1 is hydrogen, $(C_1–C_6)$alkyl, unconjugate $(C_3–C_6)$alkenyl, $XC(=O)R^{13}$, benzyl or $—CH_2CH_2—O—(C_1–C_4)$alkyl;

R^2 and R^3, together with the carbons to which they are attached, form a four to seven membered monocyclic, or ten to fourteen membered bicyclic, carbocyclic ring that can be saturated or unsaturated, wherein from one to three of the nonfused carbon atoms of said monocyclic rings, and from one to five of the carbon atoms of said bicyclic rings that are not part of the benzo rings shown in formula I, may optionally and independently be replaced by a nitrogen, oxygen or sulfur, and wherein said monocyclic and bicyclic rings may optionally be substituted with one or more substituents that are selected, independently, from $(C_1–C_6)$ alkyl optionally substituted with from one to seven fluorine atoms; $(C_1–C_6)$alkoxy optionally substituted with from one to seven fluorine atoms; nitro, cyano, halo, $(C_2–C_6)$alkenyl, $(C_2–C_6)$alkynyl, hydroxy, amino, $(C_1–C_6)$alkylamino and $((C_1–C_6)alkyl)_2$amino, $—CO_2R^4$, $—CONR^5R^6$, $—SO_2NR^7R^8$, $—C(=O)R^{13}$ and $—XC(=O)R^{13}$;

wherein each R^4, R^5, R^6, R^7, R^8 and R^{13} is selected, independently, from hydrogen and $(C_1–C_6)$ alkyl, or R^5 and R^6, or R^7 and R^8 together with the nitrogen to which they are attached, form a pyrrolidine, piperidine, morpholine, azetidine, piperazine, —N—$(C_1–C_6)$alkylpiperazine or thiomorpholine ring, or a thiomorpholine ring wherein the ring sulfur is replaced with a sulfoxide or sulfone; and

each X is, independently, $(C_1–C_6)$alkylene;

or a pharmaceutically acceptable salt thereof.

US 6,410,551 B1

TETRAZOLE DERIVATIVES

Beate Gutterer, Allensbach, Germany, assignor to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany

PCT No. PCT/EP98/04477, § 371 Date Dec. 23, 1999, § 102(e) Date Dec. 23, 1999, PCT Pub. No. WO99/05111, PCT Pub. Date Feb. 4, 1999

PCT Filed Jul. 18, 1998, Appl. No. 446,703

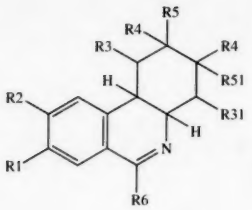
Claims priority, application European Pat. Off., Jul. 25, 1997, 97112792

Int. Cl. A61K *31/44;* **C07D** *221/06*

U.S. Cl. 514—290 **24 Claims**

1. A compound of formula I

(I)



in which

R1 is hydroxyl, 1–4C-alkoxy, 3–7C-cycloalkoxy, 3–7C-cycloalkylmethoxy or completely or predominantly fluorine-substituted 1–4C-alkoxy,

R2 is hydroxyl, 1–4C-alkoxy, 3–7C-cycloalkoxy, 3–7C-cycloalkylmethoxy or completely or predominantly fluorine-substituted 1–4C-alkoxy,

or in which

R1 and R2 together are a 1–2C-alkylenedioxy group,

R3 is hydrogen or 1–4C-alkyl,

R31 is hydrogen or 1–4C-alkyl,

or in which

R3 and R31 together are a 1–4C-alkylene group,

R4 is hydrogen or 1–4C-alkyl,

R5 is hydrogen,

R51 is hydrogen,

or in which

R5 and R51 together are an additional bond,

R6 is a phenyl radical substituted by R7, where

R7 is a tetrazol-5-yl radical substituted by a radical R8, where

R8 is hydrogen, 1–7C-alkyl, 3–7C-cycloalkyl, 3–7C-cycloalkylmethyl or Ar-1–4C-alkyl, where

Ar is a phenyl radical which is unsubstituted or substituted by R9 and/or R10, and

R9 and R10 independently of one another are halogen, nitro, cyano, 1–4C-alkyl, trifluoromethyl or 1–4C-alkoxy,

or a salt thereof.

US 6,410,552 B1

BENZOETHER AND RELATED COMPOSITIONS AND METHODS

John H. Dodd, Pittstown, N.J.; James R. Henry, Indianapolis, Ind.; Kenneth C. Rupert, South Orange, N.J.; James L. Bullington, Hamilton Square, N.J., and Daniel A. Hall, Somerset, N.J., assignors to Ortho-McNeil Pharmaceutical, Inc., Raritan, N.J.

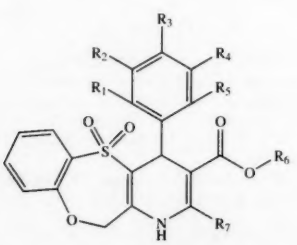
Provisional application No. 60/178,388, filed on Jan. 27, 2000. This application Dec. 28, 2000, Appl. No. 751,002.

Int. Cl. A61K *31/55;31/4365;* **C07D** *497/04;* **A61P** *9/00;11/06*

U.S. Cl. 514—291 **24 Claims**

1. A compound of Formula I,

Formula I



or a pharmaceutically acceptable salt thereof, wherein

(a) R_1, R_2, R_3, R_4 and R_5 are independently selected from the group consisting of H, OH, halogen, cyano, NO_2, alkyl, C_{1-8} alkoxy, C_{1-8} alkylsulfonyl, C_{1-4} carboalkoxy, C_{1-8} alkylthio, difluoromethoxy, difluoromethylthio, and trifluoromethyl; or R_1 and R_2 together from an oxadiazole;

(b) R_6 is selected from the group consisting of H, C_{1-5} straight or branched alkyl, alkylamine, aryl, 3-piperidyl, N-substituted 3-piperidyl, and N-substituted 2-pyrrolidinyl methylene, wherein

said N-substituted 3-piperidyl and said N-substituted 2-pyrrolidinyl methylene may be substituted with C_{1-8} straight or branched chain alkyl or benzyl, and said straight or branched alkyl may be substituted with C_{1-8} alkoxy, C_{2-8} alkanoyloxy, phenylacetyloxy, benzoyloxy, hydroxy, halogen, p-tosyloxy, mesyloxy, amino, carboalkoxy or NR'R", wherein

(i) R' and R" are independently selected from the group consisting of H, C_{1-8} straight or branched alkyl, C_{3-7} cycloalkyl, phenyl, benzyl, and phenethyl, or

(ii) R' and R" together form a heterocyclic ring selected from the group consisting of piperidino, pyrrolidino, morpholino, thiomorpholino, piperazino, and an N-substituted piperazino ring, said N-substituted piperazino ring being substituted with H, C_{1-8} straight or branched alkyl, benzyl, benzhydryl, phenyl and/or substituted phenyl (substituted with NO_2, halogen, C_{1-8} straight or branched chain alkyl, C_{1-8} alkoxy and/or trifluoromethyl); and

(c) R_7 is selected from the group consisting of H, amino, alkyl, aryl, trifluoromethyl, alkoxymethyl, 2-thieno and 3-thieno.

US 6,410,553 B1

BENZOSULFONES AND RELATED COMPOSITIONS AND METHODS

John H. Dodd, Stochton; Kenneth C. Rupert, South Orange; James L. Bullington, Hamilton Square, and Daniel A. Hall, Somerset, all of N.J., assignors to Ortho-McNeil Pharmaceutical, Inc., Raritan, N.J.

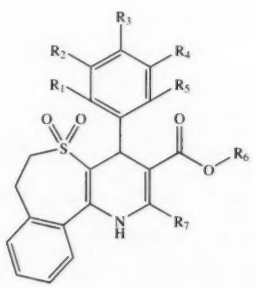
Provisional application No. 60/175,650, filed on Jan. 12, 2000. This application Dec. 28, 2000, Appl. No. 751,005.

Int. Cl. A61K *31/55;31/4365;* **C07D** *495/04;* **A61P** *9/00;11/06*

U.S. Cl. 514—291 **28 Claims**

1. A compound of Formula I,

Formula I



or a pharmaceutically acceptable salt thereof, wherein

(a) R_1, R_2, R_3, R_4 and R_5 are independently selected from the group consisting of H, OH, halogen, cyano, NO_2, alkyl, C_{1-8} alkoxy, C_{1-8} alkylsulfonyl, C_{1-4} carboalkoxy, C_{1-8} alkylthio, difluoromethoxy, difluoromethylthio, and trifluoromethyl; or R_1 and R_2 together form an oxidiazole;

(b) R_6 is selected from the group consisting of H, C_{1-5} straight or branched alkyl, alkylamine, aryl, 3-piperidyl, N-substituted 3-piperidyl, and N-substituted 2-pyrrolidinyl methylene, wherein

said N-substituted 3-piperidyl and said N-substituted 2-pyrrolidinyl methylene may be substituted with C_{1-8} straight or branched chain alkyl or benzyl, and said straight or branched alkyl may be substituted with C_{1-8} alkoxy, C_{2-8} alkanoyloxy, phenylacetyloxy, benzoyloxy, hydroxy, halogen, p-tosyloxy, mesyloxy, amino, carboalkoxy or NR'R", wherein

(i) R' and R" are independently selected from the group consisting of H, C_{1-8} straight or branched alkyl, C_{3-7} cycloalkyl, phenyl, benzyl, and phenethyl, or (ii) R' and R" together form a heterocyclic ring selected from the group consisting of piperidino, pyrrolidino, morpholino, thiomorpholino, piperazino, and an N-substituted piperazino ring, said N-substituted piperazino ring being substituted with H, C_{1-8} straight or branched alkyl, benzyl, benzhydryl, phenyl and/or substituted phenyl (substituted with NO_2, halogen, C_{1-8} straight or branched chain alkyl, C_{1-8} alkoxy and/or trifluoromethyl); and

(c) R_7 is selected from the group consisting of H, amino, alkyl, aryl, trifluoromethyl, alkoxymethyl, 2-thieno and 3-thieno.

US 6,410,554 B1

COMBINATION THERAPY FOR THE TREATMENT OF BENIGN PROSTATIC HYPERPLASIA

Theodore P. Broten, Ambler; Peter K. S. Siegl, Blue Bell, and Steven A. Nichtberger, Gladwyne, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

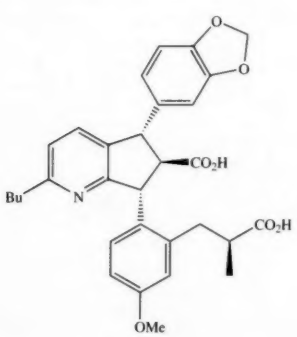
Provisional application No. 60/079,041, filed on Mar. 23, 1998. This application Mar. 23, 1999, Appl. No. 274,839.

Int. Cl. A61K *31/44;31/505*

U.S. Cl. 514—299 **7 Claims**

1. A composition comprising an alpha-1a adrenergic antagonist and an endothelin antagonist, wherein the alpha-1a adrenergic receptor antagonist is (4S)-trans-4-(3,4-difluorophenyl)-3-[1-(4-pyridin-2-yl-cyclohexyl)-(3R)-pyrrolidin-3-yl-carbamoyl]-6-methyl-2-oxo-1,2,3,4-tetrahydro-pyrimidine-5carboxylic acid methyl ester or a pharmaceutically acceptable salt thereof and the endothelin antagonist is a subtype non-selective antagonist which is Compound B

Compound B



or a pharmaceutically acceptable salt thereof.

US 6,410,555 B1

TETRAHYDRONAPHTHYRIDINYL-CARBOXAMIDES HAVING ANTI-CONVULSANT ACTIVITY

John David Harling; Frank Peter Harrington, both of Sawbridgeworth, and Mervyn Thompson, Harlow, all of United Kingdom, assignors to SmithKline Beecham p.l.c., Brentford, United Kingdom

PCT No. PCT/GB99/01826, § 371 Date Feb. 16, 2001, § 102(e) Date Feb. 16, 2001, PCT Pub. No. WO99/65903, PCT Pub. Date Dec. 23, 1999

PCT Filed Jun. 9, 1999, Appl. No. 719,335

Claims priority, application United Kingdom, Jun. 12, 1998, 9812683

Int. Cl. A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—300 **4 Claims**

1. A compound selected from the group consisting of:

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-benzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-cyano- 4-iso-propylbenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-4-methoxy- 3-trifluoromethylbenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-bromo-4-ethylbenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-bromo- 4-ethoxybenzamide;

N-(5,6,7, 8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-chloro- 4-iso-propyloxybenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-bromo- 4-iso-propyloxybenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-acetyl- 4-iso-propyloxybenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-4-ethoxy- 3-trifluoromethylbenzamide;

N-(8,8-dimethyl-5,6,7,8-tetrahydro[1,6]naphthyridin-3-yl)-4-methoxy- 3-trifluoromethylbenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-bromo- 4-methoxybenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-chloro- 4-methoxybenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-cyano- 4-methoxybenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-cyano-4-ethylbenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-bromo- 4-methylbenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-pivaloylbenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-5-chloro-2-methoxy- 4-iso-propyloxybenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-cyano- 4-ethoxybenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-4-methoxy- 3-trifluoroacetylbenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)naphthalene-2-carboxamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-cyano- 4-iso-propyloxybenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-acetyl-4-ethylbenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-2,3-dihydrobenzofuran- 5-carboxamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-n-butyroyl- 4-methoxybenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-4-methoxy- 3-n-propionylbenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl-iso-butyroyl- 4-methoxybenzamide;

N-(8,8-dimethyl-5,6,7,8-tetrahydro[1,6]naphthyridin-3-yl)-4-ethoxy- 3-trifluoromethylbenzamide;

N-(8,8-dimethyl-5,6,7,8-tetrahydro[1,6]naphthyridin-3-yl)-3-acetyl- 4-iso-propyloxybenzamide;

N-(8,8-dimethyl-5,6,7,8-tetrahydro[1,6]naphthyridin-3-yl)-3-bromo- 4-methoxybenzamide;

N-(8,8-dimethyl-5,6,7,8-tetrahydro[1,6]naphthyridin-3-yl)-3-chloro- 4-methoxybenzamide;

N-(8,8-dimethyl-5,6,7,8-tetrahydro1,6]naphthyridin-3-yl)-4-methoxy-3-pentafluoroethyl benzamide;

N-(8,8-dimethyl-5,6,7,8-tetrahydro[1,6]naphthyridin-3-yl)-4-iso-propoxy- 3-trifluoromethyl benzamide;

N-(8,8-dimethyl-5,6,7,8-tetrahydro[1,6]naphthyridin-3-yl)-4-ethyl-3-trifluoromethyl benzamide;

N-(8,8-dimethyl-5,6,7,8-tetrahydro[1,6]naphthyridin-3-yl)-3-bromo-4-iso-propyl benzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-chloro- 4-ethoxybenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-3-fluoro- 4-methoxybenzamide;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-4-methoxy- 3-pentafluoroethylbenzamide;

N-(8,8-dimethyl-5,6,7,8-tetrahydro[1,6]naphthyridin-3-yl)-3-fluoro- 4-methoxybenzamide;

N-(8,8-dimethyl-5,6,7,8-tetrahydro[1,6]naphthyridin-3-yl)-4-methoxy- 3-propionylbenzamide, and;

N-(5,6,7,8-tetrahydro-6,8,8-trimethyl[1,6]naphthyridin-3-yl)-indole-2-carboxamide.

US 6,410,556 B1

MODULATORS OF PROTEIN TYROSINE PHOSPHATESES (PTPASES)

Henrik Sune Andersen, Lyngby; Thomas Kruse Hansen, Herlev; Jesper Lau, Farum; Niels Peter Hundahl Møller, København Ø; Ole Hvilsted Olsen, Brønshøj, all of Denmark; Frank Urban Axe, Escondido, Calif.; Yu Ge; Daniel Dale Holsworth, both of San Diego, Calif.; Todd Kevin Jones, Solana Beach, Calif.; Luke Milburn Judge, Seattle, Wash.; Wiliam Charles Ripka, San Diego, Calif.; Barry Zvi Shapira, Acton, Calif., and Roy Teruyuki Uyeda, San Diego, Calif., assignors to Novo Nordisk A/S, Bagsvaerd, Denmark, and Ontogen Corporation, Carlsbad, Calif.

Provisional application No. 60/156,742, filed on Sep. 30, 1999. This application Sep. 11, 2000, Appl. No. 659,547.

Claims priority, application Denmark, Sep. 10, 1999, PA 1999 01277; Jul. 7, 2000, PA 2000 01069

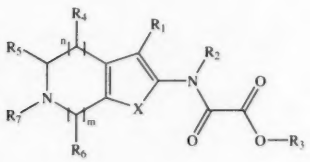
This patent is subject to a terminal disclaimer.

Int. Cl. A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—301 **77 Claims**

1. A compound of Formula 1

Formula I



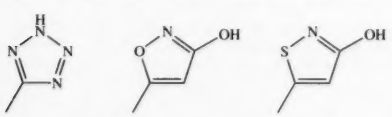
wherein

n is 0, 1 or 2;

m is 1 or 2;

X is S or O;

R_1 is hydrogen or $COOR_3$, or R_1 is selected from the group consisting of the following 5-membered heterocycles:



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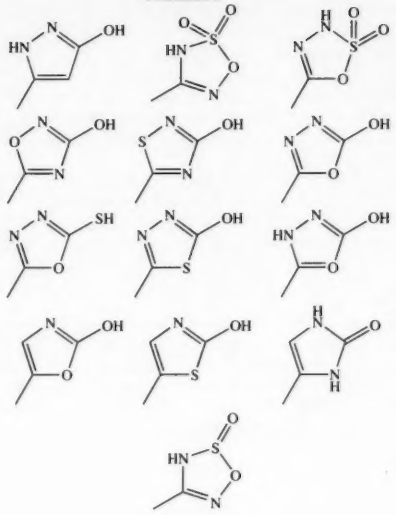


R_2 is hydrogen, C_1–C_6alkyl, hydroxy or NR_8R_9;

R_3 is hydrogen, C_1–C_6alkyl, arylC_1–C_6alkyl, C_1–C_6alkylcarbonyloxyC_1–C_6alkyl or C_1–C_6alkylcarbonyloxyaryl-C_1–C_6alkyl;

R_4, R_5 and $R_6$are independently hydrogen, trihalomethyl, C_1–C_6alkyl, aryl, arylC_1–C_6alkyl, hydroxy, oxo, carboxy, carboxyC_1–C_6alkyl, C_1–C_6alkyloxy-carbonyl, aryloxycarbonyl, arylC_1–C_6alkyloxycarbonyl, C_1–C_6alkyloxy, C_1–C_6-alkyloxyC_1–C_6alkyl, aryloxy, arylC_1–C_6alkyloxy, arylC_1–C_6-alkyloxyC_1–C_6alkyl, thio, C_1–C_6alkylthio, C_1–C_6alkyl-thioC_1–C_6alkyl, arylthio, arylC_1–C_6alkylthio, arylC_1–C_6-alkylthioC_1–C_6alkyl, NR_8R_9, $R_8R_9NC_1$–C_6alkyl, C_1–C_6-alkylaminoC_1–C_6alkyl, arylaminoC_1–C_6alkyl, arylC_1–C_6-alkylaminoC_1–C_6alkyl, di(arylC_1–C_6alkyl)aminoC_1–C_6alkyl, C_1–C_6alkylcarbonyl, C_1–C_6alkylcarbonylC_1–C_6alkyl, aryl-C_1–C_6alkylcarbonyl, arylC_1–C_6alkylcarbonylC_1–C_6alkyl, C_1–C_6alkylcarboxy, C_1–C_6alkylcarboxyC_1–C_6-alkyl, arylcarboxy, arylcarboxyC_1–C_6alkyl, arylC_1–C_6alkylcarboxy, aryl-C_1–C_6alkyl-carboxyC_1–C_6alkyl, C_1–C_6alkylcarbonylamino, C_1–C_6alkylcarbonylaminoC$_1$–C_6alkyl, -carbonylNR_8C_1–C_6-alkylCOR_{12}, arylC_1–C_6alkylcarbonylamino, arylC_1–C_6alkyl-carbonylaminoC_1–C_6alkyl, arylcarbonylaminoC_1–C_6alkyl, $CONR_8R_9$, or C_1–C_6alkyl-$CONR_8R_9$ wherein the alkyl and aryl groups are optionally substituted as defined in the definition section and R_{12} is NR_8R_9, or C_1–C_6alkylNR_8R_9;

R_7 is hydrogen, C_1–C_6alkyl, aryl, arylC_1–C_6alkyl, C_1–C_6alkyl-carbonyl, C_1–C_6alkoxycarbonyl, arylcarbonyl, aryloxocarbo-nyl, arylC_1–C_6alkylcarbonyl, aryC_1–C_6alkoxycarbonyl, C_1–C_6alkylcarboxy, arylC_1–C_6alkylcarboxy, $R_{10}R_{11}$N-carbonylC_1–C_6alkyl wherein R_{10} and R_{11} are independently selected from hydrogen, C_1–C_6alkyl, aryl, arylC_1–C_6alkyl, C_1–C_6alkyl-carbonyl, arylcarbonyl, arylC_1–C_6alkylcarbonyl, C_1–C_6alkylcarboxy or arylC_1–C_6alkylcarboxy; wherein the alkyl and aryl groups are optionally substituted as defined in the definition section;

R_8 and R_9 are independently selected from hydrogen, C_1–C_6alkyl, aryl, arylC_1–C_6alkyl, C_1–C_6alkylcarbonyl, C_1–C_6alkoxycarbonyl, arylcarbonyl, aryloxocarbonyl, aryl-C_1–C_6alkylcarbonyl, arylC_1–C_6alkoxycarbonyl, C_1–C_6alkyl-carboxy, arylC_1–C_6alkylcarboxy, $R_{10}R_{11}$NcarbonylC_1–C_6-alkyl wherein the alkyl and aryl groups are optionally substituted as defined in the definition section; or

R_8 and R_9 together with the nitrogen to which they are attached form a saturated, partially saturated or aromatic monocyclic, bicyclic or tricyclic ring system containing from 3 to 14 carbon atoms and from 0 to 3 additional heteroatoms selected from nitrogen, oxygen or sulphur, the ring system can optionally be substituted with at least one C_1–C_6alkyl, aryl, arylC_1–C_6alkyl, hydroxy, oxo, C_1–C_6aikyloxy, arylC_1–C_6-alkyloxy, C_1–C_6alkyloxyC_1–C_6alkyl, $NR_{10}R_{11}$ or C_1–C_6alkyl-aminoC_1–C_6alkyl, wherein R_{10} and R_{11} are independently selected from hydrogen, C_1–C_6alkyl, aryl, arylC_1–C_6alkyl, C_1–C_6alkylcarbonyl, arylcarbonyl, arylC_1–C_6alkylcarbonyl, C_1–C_6alkylcarboxy or arylC_1–C_6alkylcarboxy; wherein the alkyl and aryl groups are optionally substituted as defined in the definition section; or

R_8 and R_9 are independently a saturated or partial saturated cyclic 5, 6 or 7 membered amine, imide or lactam;

or a salt thereof with a pharmaceutically acceptable acid or base, or any optical isomer or mixture of optical isomers, a racemic mixture, or any tautomeric form, or prodrug thereof.

US 6,410,557 B2
DRY SKIN REMEDIES

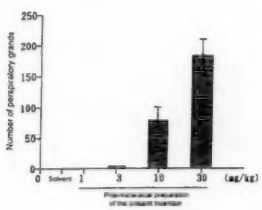
Keiji Hayashi, Matsudo; Hirohiko Arisawa, Minamikawachi-machi, and Hiroaki Masunaga, Mibu-machi, all of Japan, assignors to Daiichi Pharmaceutical Col, Ltd., Tokyo, Japan

Continuation of application No. PCT/JP00/00120, filed on Jan. 13, 2000. This application Jul. 5, 2001, Appl. No. 898,256.

Claims priority, application Japan, Jan. 14, 1999, 11-008238

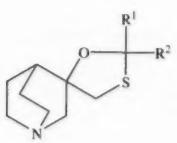
Int. Cl. A61K *31/44;* **C07D** *453/00*

U.S. Cl. 514—305 **3 Claims**



1. A therapeutic agent for the treatment of dry skin, comprising a compound represented by the following formula (I) or an acid addition salt thereof as an active ingredient:

(I)



wherein, R^1 and R^2 may be the same or different, and each represents hydrogen, alkyl, cyclopentyl, cyclohexyl, aryl, or diarylmethilol groups or an alkyl group which is substituted by one or more aryl groups.

US 6,410,558 B1
FUNGICIDES FOR THE CONTROL OF TAKE-ALL DISEASE OF PLANTS

Dennis Paul Phillion, St. Charles, Mo.; Diane Susan Braccolino, Copley, Ohio; Matthew James Graneto, St. Louis, Mo.; Wendell Gary Phillips, Glencoe, Mo.; Karey Alan Van Sant, St. Charles, Mo.; Daniel Mark Walker, Maryland Heights, Mo., and Sai Chi Wong, Chesterfield, Mo., assignors to Monsanto Technology LLC, St. Louis, Mo.

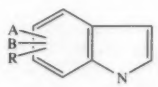
Division of application No. 09/162,032, filed on Sep. 28, 1998, now Pat. No. 6,252,078, which is a division of application No. 08/365,382, filed on Dec. 28, 1994, now Pat. No. 5,849,723, which is a division of application No. 08/238,182, filed on May 4, 1994, now abandoned, which is a continuation of application No. 07/951,997, filed on Oct. 2, 1992, now abandoned, which is a continuation-in-part of application No. 07/780,683, filed on Oct. 18, 1991, now abandoned. This application Nov. 27, 2000, Appl. No. 722,829.

Int. Cl. A61K *31/47;31/405;* **C07D** *215/38;209/02*

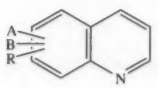
U.S. Cl. 514—311 **66 Claims**

1. A method of controlling disease in plants caused by Gaeumannomyces sp. comprising applying to the plant locus a fungicidally effective amount of a fungicide of the formula selected from:

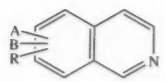
(a)



(b)



(c)



wherein

A is selected from —C(X)-amine, —C(O)—SR_3, —NH—C(X)R_4, and —C(=NR_3)—XR_7;

X is O or S;

B is —W_m—$Q(R_2)_3$ or selected from o-tolyl, 1-naphthyl, 2-naphthyl, and 9-phenanthryl, each optionally substituted with halogen or R_4;

W is —$C(R_3)_pH_{(2-p)}$—; or when Q is C, W is selected from —$C(R_3)_pH_{(2-p)}$—, —$N(R_3)_mH_{(1-m)}$—, —$S(O)_p$—, and —O—;

m is 0 or 1;

Q is C, Si, Ge, or Sn;

p is 0, 1, or 2;

R is 0, 1 or 2;

wherein each R is independently selected from

a) halo, formyl, cyano, amino, nitro, thiocyanato, isothiocyanato, trimethylsilyl, and hydroxy;

b) C1–C4 alkyl, alkenyl, alkynyl, C3–C6 cycloalkyl, and cycloalkenyl, each optionally substituted with halo, hydroxy, thio, amino, nitro, cyano, formyl, phenyl, C1–C4 alkoxy, alkylcarbonyl, alkylthio, alkylamino, dialkylamino, alkoxycarbonyl, (alkylthio)carbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkylsulfinyl, or alkylsulfonyl;

c) phenyl, furyl, thienyl, pyrrolyl, each optionally substituted with halo, formyl, cyano, amino, nitro, C1–C4 alkyl, alk-

enyl, alkynyl, alkoxy, alkylthio, alkylamino, dialkylamino, haloalkyl, and haloalkenyl;

d) C1–C4 alkoxy, alkenoxy, alkynoxy, C3–C6 cycloalkyloxy, cycloalkenyloxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkylamino, dialkylamino, alkylcarbonylamino, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkylcarbonyl, alkylcarbonyloxy, alkoxycarbonyl, (alkylthio)carbonyl, phenylcarbonylamino, phenylamino, each optionally substituted with halo;

each R_2 is independently selected from alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl and phenyl, each optionally substituted with R_4 or halogen; and wherein, when Q is C, R_2 may also be selected from halo, alkoxy, alkylthio, alkylamino, and dialkylamino;

wherein two R_2 groups may be combined to form a cyclo group with Q;

R_3 is C1–C4 alkyl;

R_4 is C1–C4 alkyl, haloalkyl, alkoxy, alkylthio, alkylamino, or dialkylamino; and

R_7 is C1–C4 alkyl, haloalkyl, or phenyl, optionally substituted with halo, nitro, or R_4;

or an agronomic salt thereof.

US 6,410,559 B2

HETEROCYCLIC COMPOUNDS AND THEIR THERAPEUTIC USE

Hazel Joan Dyke, and John Gary Montana, both of Cambridge, United Kingdom, assignors to Darwin Discovery, Ltd., United Kingdom

Division of application No. 09/433,274, filed on Nov. 3, 1999, now Pat. No. 6,262,070, Provisional application No. 60/112,545, filed on Dec. 16, 1998. This application Mar. 30, 2001, Appl. No. 822,071.

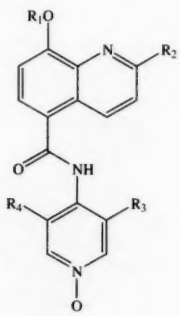
Claims priority, application United Kingdom, Nov. 4, 1998, 9824160

Int. Cl. A61K *31/47*

U.S. Cl. 514—311 **6 Claims**

1. A method for the treatment of a disease state that is capable of being modulated by inhibition of phosphodiesterase IV or Tumour Necrosis Factor, or that is a pathological condition associated with a function of phosphodiesterase IV, eosinophil accumulation or a function of the eosinophil, wherein the disease state is an inflammatory disease or an autoimmune disease, said method comprising administering to a person or animal an effective amount of the compound of formula (i)

(i)



wherein

R_1 is CH_3, CH_2F, CHF_2 or CF_3;

R_2 is CH_3 or CF_3;

R_3 is F, Cl, Br, CN or CH_3; and

R_4 is H, F, Cl, Br, CN or CH_3;

or a pharmaceutically-acceptable salt thereof.

US 6,410,560 B1

DRUG FOR RELIEVING PAIN AND PROMOTING THE REMOVAL OF CALCULI IN UROLITHIASIS

Masuo Akahane, and Yoshitaka Tomiyama, both of Nagano, Japan, assignors to Kissei Pharmaceutical Co., Ltd., Japan

Division of application No. 09/077,293, filed on May 29, 1998, now abandoned, which is a continuation-in-part of application No. PCT/JP96/03494, filed on Nov. 29, 1996, now abandoned. This application Nov. 24, 1999, Appl. No. 448,423.

Claims priority, application Japan, Nov. 30, 1995, 7-346599

Int. Cl. A61K *31/47;31/36;31/24;31/195*

U.S. Cl. 514—312 **6 Claims**

1. A drug composition for relieving pain and promoting the removal of calculi in urolithiasis, containing active ingredients in the form of a mixture of different compounds, each of which compounds has selective stimulating effects on one or both β_2- and β_3-adrenoceptors, and which mixture collectively has selective stimulating effects on both β_2- and β_3-adrenoceptors.

US 6,410,561 B1

AMIDE DERIVATIVES AND NOCICEPTIN ANTAGONISTS

Hisashi Shinkai; Takao Ito, and Hideki Yamada, all of Takatsuki, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

PCT No. PCT/JP99/01462, § 371 Date Sep. 22, 2000, § 102(e) Date Sep. 22, 2000, PCT Pub. No. WO99/48492, PCT Pub. Date Sep. 30, 1999

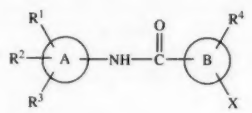
PCT Filed Mar. 23, 1999, Appl. No. 646,781

Claims priority, application Japan, Mar. 26, 1998, 10-100029

Int. Cl. A61K *31/47;* **C07D** *215/38;215/16*

U.S. Cl. 514—313 **12 Claims**

1. A method for treating pain, comprising administering to a host an effective amount of an amide derivative of the formula [1]



wherein

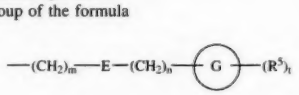
R^1 and R^2 are the same or different and each is hydrogen atom, lower alkyl optionally substituted by hydroxy, amino, lower alkylamino or di(lower)alkylamino;

R^3 and R^4 are the same or different and each is hydrogen atom, halogen atom or lower alkyl:

ring A is quinolyl;

ring B is phenyl, thienyl, furyl, pyrrolyl, pyrrolidinyl, oxazolyl or cyclohexenyl; and

X is a group of the formula



wherein

E is a single bond, carbonyl, sulfinyl, —O—, —S—, —NHCO—, —CH=CR^6— wherein R^6 is hydrogen atom or aryl or —NR^7— wherein R^7 is hydrogen atom, lower alkyl or lower alkoxycarbonyl;

ring G is aryl, a heterocyclic group selected from the group consisting of pyrrolyl, thienyl, furyl, imidazolyl, pyrazolyl, oxazolyl, thiazolyl, indolyl, benzofuranyl, benzimidazolyl, imidazolidinyl, indolinyl, pyrrolidinyl, carbazolyl and 2,3-dihydrobenzofuranyl, cycloalkyl or condensed aryl;

R^5 is halogen atom, hydroxy, lower alkyl optionally substituted by any of halogen atom, hydroxy, lower alkanoyloxy and lower alkoxy optionally substituted by lower alkoxy, lower alkoxy optionally substituted by lower alkoxy, amino, lower alkylamino, di(lower)alkylamino, nitro, cyano, lower

alkanoyl, lower alkanoyloxy, carboxy, lower alkoxycarbonyl, lower alkylsulfonyl or phenyl;

t is 0 or an integer of 1 to 5, which indicates the number of substituents on the ring G, wherein when t is an integer of 2 to 5, each R^5 is the same or different;

m is 0 or an integer of 1 to 8; and

n is 0 or an integer of 1 to 4,

or a pharmaceutically acceptable salt thereof.

US 6,410,562 B1

HYPOGLYCEMIC IMIDAZOLINE COMPOUNDS

Michael R. Jirousek, Antioch, Ill.; Michael Paal; Gerd Ruhter, both of Hamburg, Germany; Theo Schotten, Vierhufen, Germany; Kumiko Takeuchi, Indianapolis, Ind., and Wolfgang Stenzel, Reinbek, Germany, assignors to Eli Lilly and Company, Indianapolis, Ind.

PCT No. PCT/US98/27080, § 371 Date Dec. 8, 2001, § 102(e) Date Dec. 8, 2001, PCT Pub. No. WO99/32482, PCT Pub. Date Jul. 1, 1999

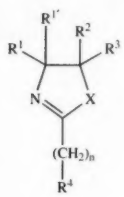
PCT Filed Dec. 18, 1998, Appl. No. 581,498

Int. Cl. A61K *31/47;31/425;* **C07D** *215/12;277/04;403/02*

U.S. Cl. 514—314 **38 Claims**

1. A compound of Formula (I):

(I)



wherein

X is —O—, —S—, or —NR^5—;

R^5 is hydrogen, C_{1-8} alkyl, or an amino protecting group;

R^1, $R^{1'}$, R^2, and R^3 are independently hydrogen or C_{1-8} alkyl;

R^1 and R^2 optionally together form a bond and $R^{1'}$ and R^3 are independently hydrogen or C_{1-8} alkyl;

R^1 and R^2 optionally combine together with the carbon atoms to which they are attached form a C_{3-7} carbocyclic ring and $R^{1'}$ and R^3 are independently hydrogen or C_{1-8} alkyl;

R^1 and $R^{1'}$ together with the carbon atom to which they are attached optionally combine to form a C_{3-7} spirocarbocyclic ring and R^2 and R^3 are independently hydrogen or C_{1-8} alkyl;

R^2 and R^3 together with the carbon atom to which they are attached optionally combine to form a C_{3-7} spirocarbocyclic and R^1 and $R^{1'}$ are independently hydrogen or C_{1-8} alkyl;

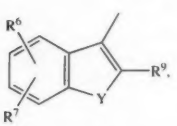
n is 0, 1, or 2;

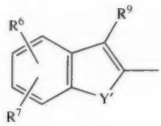
m is 0, 1 or 2;

m' is 0, 1, or 2;

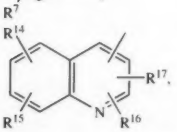
q' is 0,1,2,3,4, or 5;

R^4 is





, or



Y is —O—, —S—, or —NR^8—;

Y' is —O— or —S—;

R^6 and R^7 are independently hydrogen, C_{1-8} alkyl, C_{3-7} cycloalkyl, C_{1-8} alkoxy, C_{1-8} alkylthio, halo C_{1-8} alkylthio, C_{1-8} alkylsulfinyl, C_{1-8} alkylsulfonyl, C_{3-7} cycloalkoxy, aryl-C_{1-8} alkoxy, halo, halo-C_{1-8} alkyl, halo-C_{1-8} alkoxy, nitro, —$NR^{10}R^{11}$, —$CONR^{10}R^{11}$, aryl C_{1-8} alkyl, optionally substituted heterocyclyl, optionally substituted phenyl, optionally substituted naphthyl, optionally halo substituted acylamino, cyano, hydroxy, COR^{12}, halo C_{1-8} alkylsulfinyl, or halo C_{1-8} alkylsulfonyl, or alkoxyalkyl of the formula

$CH_3(CH_2)_p$—O—$(CH_2)_q$—O—;

where

p is 0, 1, 2, 3, or 4; and

q is 1, 2, 3, 4, or 5;

R^{12} is C_{1-8} alkyl or optionally substituted phenyl;

R^8 is hydrogen, C_{1-8} alkyl, halo-C_{1-8} alkyl, optionally substituted phenyl, optionally substituted heterocyclyl, COO C_{1-8} alkyl, optionally substituted COaryl, COC_{1-8} alkyl, SO_2C_{1-8} alkyl, optionally substituted SO_2 aryl, optionally substituted phenyl-C_{1-8} alkyl, $CH_3(CH_2)_p$—O—$(CH_2)_q$—O—;

R^9 is hydrogen, halo, C_{1-8} alkyl, halo C_{1-8} alkyl, C_{1-8} alkylthio, halo C_{1-8} alkylthio, C_{3-7} cycloalkylthio, optionally substituted arylthio or heteroarylthio, C_{1-8} alkoxy, C_{3-7} cycloalkoxy, optionally substituted aryloxy, optionally substituted heteroaryloxy, or optionally substituted aryl or heteroaryl, C_{3-7} cycloalkyl, halo C_{3-7} cycloalkyl, C_{3-7} cycloalkenyl, cyano, $COOR^{10}$,$CONR^{10}R^{11}$ or $NR^{10}R^{11}$, C_{2-6} alkenyl, optionally substituted heterocyclyl, optionally substituted aryl C_{1-8} alkyl, optionally substituted heteroaryl C_{1-8} alkyl in which the alkyl group can be substituted by hydroxy, or C_{1-8} alkyl substituted by hydroxy,

R^{10} and R^{11} are independently hydrogen, C_{1-8} alkyl, optionally substituted aryl C_{1-8} alkyl, optionally substituted phenyl, or R^{10} and R^{11} together with the nitrogen atom to which they are attached may combine to form a ring with up to six carbon atoms which optionally may be substituted with up to two C_{1-8} alkyl groups or one carbon atom may be replaced by oxygen or sulfur;

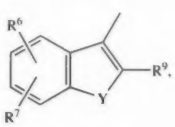
R^{14} and R^{16} are independently hydrogen, halo, C_{1-8} alkyl, C_{3-7} cycloalkyl, C_{3-7} cycloalkoxy, C_{3-7} cycloalkylC_{1-8} alkoxy, halo-C_{1-8} alkyl, halo-C_{1-8} alkoxy, C_{1-8} alkoxy, carbo(C_{1-8})alkoxy, optionally substituted aryl, or optionally substituted heteroaryl;

R^{15} and R^{17} are independently hydrogen, halo, C_{1-8} alkoxy, C_{3-7}-cycloalkyl, C_{3-7} cycloalkylC_{1-8} alkoxy, C_{1-8} alkyl, C_{3-7} cycloalkoxy, hydroxy, halo C_{1-8} alkoxy, carbo(C_{1-8})alkoxy, optionally substituted phenyl, optionally substituted phenyl-C_{1-8} alkyl, optionally substituted phenyloxy, optionally substituted phenyl-C_{1-8} alkoxy, (tetrahydropyran-2-yl)methoxy, C_{1-8} alkyl-$S(O)_m$—, optionally substituted aryl-C_{1-8} alkyl-$S(O)_{m'}$—, $CH_3(CH_2)_p$— Z^1—$(CH_2)_q$—Z^2—, or Z^3—$(CH_2)_q$—Z^2—;

Z^1 and Z^2 are independently a bond, O, S, SO, SO_2, sulphoximino, or NR^{10}; and

Z^3 is hydroxy, protected hydroxy, $NR^{10}R^{11}$, protected amino, SH or protected SH;

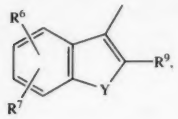
provided that when R^4 is



and Y is O or S, then R^7 is hydrogen, R^6 is hydrogen, halo, C_{1-6} alkyl, or halo C_{1-6} alkyl; and

R^9 is C_{1-6} alkyl or optionally substituted phenyl;

further provided that when R^4 is

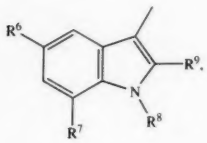


and Y is —NR^8— then R^1, $R^{1'}$, R^2 and R^3 are hydrogen or methyl;

X is —NH—;

n is 0, 1 or 2;

R^4 is



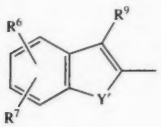
R^6 is chloro, fluoro, methyl, trifluoromethyl, or pentafluoroethyl;

R^7 is hydrogen or chloro, and most preferably hydrogen;

R^8 is hydrogen; and

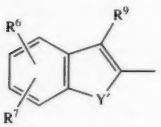
R^9 is hydrogen, methyl, benzyl, 3-chlorobenzyl, 4-chlorophenyl, 3-chlorophenyl, 2-chlorophenyl, 3-methylphenyl, 4-chloro-3-methylphenyl, 4-methoxyphenyl, or 2-methoxyphenyl;

further provided that when R^4 is



and Y' is O, then R^7 is hydrogen, R^9 is hydrogen, and R^6 is hydrogen, halo, C_{1-6} alkyl, or optionally substituted phenyl, naphthyl, or thienyl;

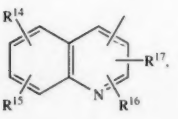
further provided that when R^4 is



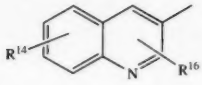
and Y' is S then R^7 is hydrogen, $R^6$is hydrogen halo, C_{1-6} alkyl, halo C_{1-6} alkyl, C_{1-6} alkoxy; and

R^9 is hydrogen, halo, C_{1-4} alkoxy, C_{1-4} alkyl, optionally substituted phenyl, naphthyl, or thienyl, or an optionally substituted phenylmethyl, optionally substituted naphthylmethyl, optionally substituted thienylmethyl, or optionally substituted pyridylmethyl group in which the methyl group is substituted by hydroxy;

Further provided that when R^4 is



then R^4 is



R^{14} is hydrogen, halo, C1–4 alkyl, C1–4 alkoxy, or halo C1–4 alkyl; and

R^{16} is C1–4 alkyl, halo C1–4 alkyl, or optionally substituted phenyl;

or a pharmaceutically acceptable salt or ester thereof.

US 6,410,563 B1

SUBSTITUTED 8-ARYLQUINOLINE PHOSPHODIESTERASE-4 INHIBITORS

Denis Deschenes, Dorval; Daniel Dube, St Lazare; Michel Gallant, Montreal-Quest; Yves Girard, Ile Bizard; Patrick Lacombe, Montreal; Dwight MacDonald, Ile Bizard, all of Canada; Anthony Mastracchio, Linden, N.J., and Helene Perrier, Montreal, Canada, assignors to Merck Frosst Canada & Co., Kirkland, Canada

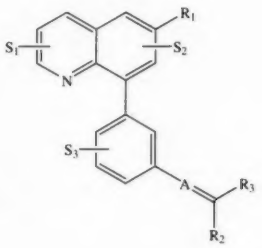
Provisional application No. 60/171,522, filed on Dec. 22, 1999. This application Dec. 20, 2000, Appl. No. 741,517.

Int. Cl. A61K *31/4709;31/47;* **C07D** *215/14;401/10;413/10*

U.S. Cl. 514—314 **23 Claims**

1. A compound represented by Formula (I):

(I)



or a prodrug, or a pharmaceutically acceptable salt thereof, wherein:

S_1, S_2, and S_3 are independently H, —OH, halogen, —C_1–C_6alkyl, —NO_2, —CN, or —C_1–C_6alkoxy, wherein the alkyl and alkoxy groups are optionally substituted with 1–5 substituents; wherein each substituent is independently a halogen or OH;

R_1 is a H, OH, halogen, or carbonyl group, —C_1–C_6alkyl group, -cycloC_3–C_6alkyl group, —C_1–C_6alkenyl group, —C_1–C_6alkoxy group, aryl group, heteroaryl group, —CN, -heterocycloC_3–C_6alkyl group, -amino group, —C_1–C_6alkylamino group, —(C_1–C_6alkyl)(C_1– C_6alkyl)amino group, —C_1–C_6alkyl(oxy)C_1–C_6alkyl group, —C(O)NH(aryl) group, —C(O)NH(heteroaryl) group, —SO_nNH(aryl) group, —SO_nNH(heteroaryl) group, —SO_nNH(C_1– C_6alkyl) group, —C(O)N(C_0–C_6alkyl)(C_0–C_6alkyl) group, —NH—SO_n—(C_1–C_6alkyl) group, —SO_n—(C_1–C_6alkyl) group, —(C_1–C_6alkyl)—O—C(CN)-dialkylamino group, or —(C_1–C_6alkyl)—SO_n—(C_1–C_6alkyl) group, wherein any of the groups is optionally substituted with 1–5 substituents; wherein each substituent is independently a halogen, —OH, —CN, —C_1–C_6alkyl, -cycloC_3–C_6alkyl, —C(O)(heterocycloC_3–C_6alkyl), —C(O)—O—(C_0–C_6alkyl), —C(O)-aryloxy, —C_1– C_6alkoxy, —(C_0–C_6alkyl)(C_0–C_6alkyl)amino, cycloalkyloxy, acyl, acyloxy, -cycloC_3–C_6alkyl, heterocycloC_3–C_6alkyl, aryl, heteroaryl, carbonyl, carbamoyl, or —SO_n—(C_1–C_6alkyl);

A is CH, or C-R_4;

R_2 and R_3 independently is an aryl group, heteroaryl group, H, halogen, —CN, —C_1–C_6alkyl group, -hetero-cycloC_3–C_6alkyl, —C_1–C_6alkoxy group, carbonyl group, carbamoyl group, —C(O)OH, —(C_1–C_6alkyl)—SO_n—(C_1–C_6alkyl) group, —C(O)N(C_0– C_6alkyl)(C_0–C_6alkyl) group, or —C_1–C_6alkylacylamino group, wherein any of the groups is optionally substituted with 1–5 substituents, wherein each substituent is independently a halogen, —NO_2, —C(O)OH, —CN, N-oxide, —OH, or an aryl, heteroaryl, carbonyl, —C_1–C_6alkyl, —SO_n—(C_1–C_6alkyl), —SO_n—(aryl), aryloxy, -heteroaryloxy, C_1–C_6alkoxy, —C(O)-heterocycloC_3–C_6alkyl, —NH-cycloC_3–C_6alkyl, amino, —(C_0–C_6alkyl)(C_0–C_6alkyl)amino, or —C(O)—N(C_0–C_6-alkyl)(C_0– C_6alkyl) substituent group, wherein each substituent group independently is optionally substituted with —OH, C_1– C_6alkoxy, —C_1–C_6alkyl, -cycloC_3–C_6alkyl, aryloxy, —C(O)OH, —C(O)O(C_1–C_6alkyl), halogen, —NO_2, —CN, —SO_n—(C_1–C_6alkyl), or —C(O)—N(C_0– C_6alkyl)(C_0–C_6-alkyl);

one of R_2 and R_3 must be an aryl or heteroaryl, optionally substituted;

when R_2 and R_3 are both an aryl or heteroaryl, then R_2 and R_3 may be optionally connected by a thio, oxy, or (C_1–C_4alkyl) bridge to form a fused three ring system;

R_4 is an aryl group, —C_1–C_6alkyl group, heteroaryl group, —CN, carbonyl, carbamoyl group, —(C_1–C_6alkyl)—SO_n—(C_1–C_6alkyl) group, —C(O)N(C_0– C_6alkyl)(C_0–C_6alkyl) group, or —C_1–C_6alkylacylamino group, wherein any of the groups is optionally substituted with 1–5 substituents, wherein each substituent is independently a carbonyl, —CN, halogen, —C(O)(C_0– C_6alkyl), —C(O)O(C_0–C_6alkyl), —C_1–C_6alkyl, —SO_n—(C_1–C_6alkyl), —OH, C_1–C_6alkoxy, or —(C_0–C_6alkyl)(C_0–C_6alkyl)amino;

n is independently 0, 1, or 2; and

R_2 or R_3 may optionally be joined to R_4 by a bond to form a ring.

US 6,410,564 B1

NAPHTHYL COMPOUNDS, INTERMEDIATES, PROCESSES, COMPOSITIONS, AND METHODS

Henry U. Bryant, Indianapolis; George J. Cullinan, Trafalgar; Jeffrey A. Dodge, Indianapolis; Kennan J. Fahey, Indianapolis; Charles D. Jones, Indianapolis; Charles W. Lugar, McCordsville, and Brian S. Muehl, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

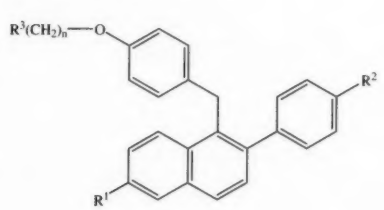
Division of application No. 08/309,525, filed on Sep. 20, 1994. This application Apr. 21, 1995, Appl. No. 428,922.

Int. Cl. A61K *31/445;* **C07D** *211/06*

U.S. Cl. 514—319 **29 Claims**

1. A compound of formula I

I



wherein

R^1 is —H, —OH, —O(C_1–C_4 alkyl), —$OCOC_6H_5$, —OCO(C_1–C_5 alkyl), or —OSO_2(C_4–C_6 alkyl);

R^2 is —H, —OH, —O(C_1–C_4 alkyl), —$OCOC_6H_5$, —OCO(C_1–C_6 alkyl) or —OSO_2(C_4–C_6 alkyl);

n is 2 or 3; and

R^3 is 1-piperidinyl, 1-pyrrolidinyl, methyl-1-pyrrolidinyl, dimethyl-1-pyrrolidinyl, 4-morpholino, dimethylamino, diethylamino, or 1-hexamethyleneimino; or a pharmaceutically acceptable salt thereof.

US 6,410,565 B1

α1-ADRENERGIC RECEPTOR ANTAGONISTS

George Joseph Cullinan, Trafalgar, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

PCT No. PCT/US00/01449, § 371 Date Jun. 22, 2001, § 102(e) Date Jun. 22, 2001, PCT Pub. No. WO00/45806, PCT Pub. Date Aug. 10, 2000

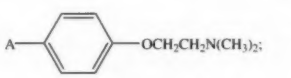
Provisional application No. 60/118,369, filed on Feb. 3, 1999. This PCT application Jan. 21, 2000, Appl. No. 869,406.

Int. Cl. A61K *31/445;31/135*

U.S. Cl. 514—320 **10 Claims**

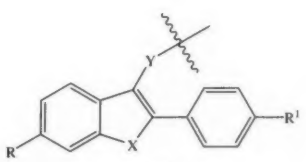
1. A method for antagonizing the α_1-adrenergic receptor comprising administering, to a mammal in need thereof, an effective amount of a compound of formula I:

I



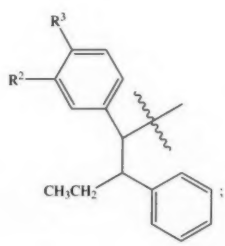
or an N-oxide or pharmaceutical salt or solvate thereof; wherein A is a moiety selected from the group consisting of:

(1)



and

(2)



wherein:

R and R^1 are independently hydrogen, hydroxy, chloro, bromo, C_1–C_4 alkyl, C_1–C_4 alkoxy, $OCOC_1$–C_6 alkyl, OCO(phenyl), or OCO(substituted phenyl);

X is oxygen or sulfur; and

Y is oxygen, CH_2, or CO.

US 6,410,566 B1

CYCLIC AMINE DERIVATIVES AND THEIR USE AS DRUGS

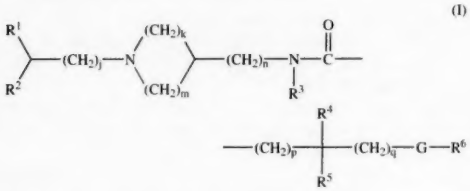
Tatsuki Shiota; Ken-ichiro Kataoka; Minoru Imai; Takaharu Tsutsumi, all of Hino; Masaki Sudoh, Handa; Ryo Sogawa; Takuya Morita, both of Hino; Takahiko Hada, Okayama; Yumiko Muroga, Hino; Osami Takenouchi, Hino; Minoru Furuya, Hino; Noriaki Endo, Hino, all of Japan; Christine M. Tarby, Hockessin, Del.; Wilna Moree, San Diego, and Steven Teig, Palo Alto, both of Calif., assignors to Teijin Limited, Osaka, Japan, and Dupont Phamaceuticals Company, San Diego, Calif.

Division of application No. 09/554,562, filed on May 16, 2000. This application Jul. 16, 2001, Appl. No. 905,077.

Int. Cl. A01N *43/40*

U.S. Cl. 514—329 **35 Claims**

1. A compound of the formula (I) below:



(I)

a pharmaceutically acceptable acid addition salt thereof or a pharmaceutically acceptable C_1–C_6 alkyl addition salt thereof,

wherein R^1 is a phenyl group, a C_3–C_8 cycloalkyl group, or an aromatic heterocyclic group having 1–3 heteroatoms selected from the group consisting of an oxygen atom, a sulfur atom, a nitrogen atom, or a combination thereof, in which the phenyl or aromatic heterocyclic group may be condensed with a benzene ring or an aromatic heterocyclic group having 1–3 heteroatoms selected from the group consisting of an oxygen atom, a sulfur atom, a nitrogen atom, or a combination thereof, to form a condensed ring, and the phenyl group, C_3–C_8 cycloalkyl group, aromatic heterocyclic group, or condensed ring may be substituted with one or more of a halogen atom, a hydroxy group, a cyano group, a nitro group, a carboxy group, a carbamoyl group, a C_1–C_6 alkyl group, a C_3–C_8 cycloalkyl group, a C_2–C_6 alkenyl group, a C_1–C_6 alkoxy group, a C_1–C_6 alkylthio group, a C_3–C_5 alkylene group, a C_2–C_4 alkylenoxy group, a C_1–C_3 alkylenedioxy group, a phenyl group, a phenoxy group, a phenylthio group, a benzyl group, a benzyloxy group, a benzoylamino group, a C_2–C_7 alkanoyl group, a C_2–C_7 alkoxycarbonyl group, a C_2–C_7 alkanoyloxy group, a C_2–C_7 alkanoylamino group, a C_2–C_7 N-alkylcarbamoyl group, a C_4–C_9 N-cycloalkylcarbamoyl group, a C_1–C_6 alkylsulfonyl group, a C_3–C_8 (alkoxycarbonyl)methyl group, a N-phenylcarbamoyl group, a piperidinocarbonyl group, a morpholinocarbonyl group, a 1-pyrrolidinylcarbonyl group, a divalent group represented by the formula: —NH(C═O)O—, a divalent group represented by the formula: —NH(C═S)O—, an amino group, a mono(C_1–C_6 alkyl)amino group, or a di(C_1–C_6 alkyl)amino group, wherein the substituent for the phenyl group, C_3–C_8 cycloalkyl group, aromatic heterocyclic group, or condensed ring is optionally substituted with one or more of a halogen atom, a hydroxy group, an amino group, atrifluoromethyl group, a C_1–C_6 alkyl group, or a C_1–C_6 alkoxy group;

R^2 is a hydrogen atom, a C_1–C_6 alkyl group, a C_2–C_7 alkoxycarbonyl group, a hydroxy group, or a phenyl group, in which the C_1–C_6 alkyl or phenyl group may be substituted with one or more of a halogen atom, a hydroxy group, a C_1–C_6 alkyl croup, or a C_1–C_6 alkoxy group, and when j=0, R^2 is not a hydroxy group;

j represents an integer of 0–2;

k represents an integer of 0–2;

m represents an integer of 2–4, with the proviso that the total sum of k and m is 4;

n represents 0 or 1; and further with the proviso that when k=2, m=2, n=0 and R^1 is an indolyl group, then j=0 and R^2 is a hydrogen atom;

R^3 is a hydrogen atom or a C_1–C_6 alkyl group optionally substituted with one or two phenyl groups each of which may be substituted with one or more of a halogen atom, a hydroxy group, a C_1–C_6 alkyl group, or a C_1–C_6 alkoxy group;

R^4 and R^5 are the same or different from each other and are a hydrogen atom, a hydroxy group, a phenyl group, or a C_1–C_6 alkyl group, in which the C_1–C_6 alkyl group is optionally substituted with one or more of a halogen atom, a hydroxy group, a cyano group, a nitro group, a carboxy group, a carbamoyl group, a mercapto group, a guanidino group, a C_3–C_8 cycloalkyl group, a C_1–C_6 alkoxy group, a C_1–C_6 alkylthio group, a phenyl group optionally substituted with one or more of a halogen atom, a hydroxy group, a C_1–C_6 alkyl group, a C_1–C_6 alkoxy group, or a benzyloxy group, a phenoxy group, a benzyloxy group, a benzyloxycarbonyl group, a C_2–C_7 alkanoyl group, a C_2–C_7, alkoxycarbonyl group, a C_2–C_7 alkanoyloxy group, a C_2–C_7 alkanoylamino group, a C_2–C_7 N-alkylcarbamoyl group, a C_1–C_6 alkylsulfonyl group, an amino group, a mono(C_1–C_6 alkyl)amino group, a di(C_1–C_6 alkyl)amino group, or an aromatic heterocyclic group having 1–3 of heteroatoms selected from the group consisting of an oxygen atom, a sulfur atom, a nitrogen atom, or a combination thereof and optionally condensed with benzene ring, with the proviso that when one of R^4 and R^5 is a hydrogen atom, the other is not an isobutyl group, or R^4 and R^5 taken together form a 3 to 6 membered cyclic hydrocarbon;

p represents 0 or 1;

q represents 0 or 1;

G is a group represented by —CO—, —SO_2—, —CO—O—, —NR^7—CO—, —CO—NR^7—, —NH—CO—NH—, —NH—CS—NH—, —NR^7—SO_2—, —SO_2—NR^7—, —NH—CO—O—, or —O—CO—NH—, wherein R^7 is a hydrogen atom or a C_1–C_6 alkyl group, or R^7 taken together with R^5 represents C_2–C_5 alkylene group;

R^6 is a phenyl group, a C_3–C_8 cycloalkyl group, a C_3–C_8 cycloalkenyl group, a benzyl group, or an aromatic heterocyclic group having 1–3 heteroatoms selected from the group consisting of an oxygen atom, a sulfur atom, a nitrogen atom, or a combination thereof, in which the phenyl, benzyl, or aromatic heterocyclic group may be condensed with a benzene ring or an aromatic heterocyclic group having 1–3 heteroatoms selected from the group consisting of an oxygen atom, a sulfur atom, a nitrogen atom, or a combination thereof, to form a condensed ring, and the phenyl group, C_3–C_8 cycloalkyl group, C_3–C_8 cycloalkenyl group, benzyl group, aromatic heterocyclic group, or condensed ring may be substituted with one or more of a halogen atom, a hydroxy group, a mercapto group, a cyano group, a nitro group, a thiocyanato group, a carboxy group, a carbamoyl group, a trifluoromethyl group, a C_1–C_6 alkyl group, a C_3–C_6 cycloalkyl group, a C_2–C_6 alkenyl group, a C_1–C_6 alkoxy group, a C_3–C_8 cycloalkyloxy group, a C_1C_6 alkylthio group, a C_1–C_3 alkylenedioxy group, a phenyl group, a phenoxy group, a phenylamino group, a benzyl group, a benzoyl group, a phenylsulfinyl group, a phenylsufonyl group, a 3-phenylureido group, a C_2–C_7 alkanoyl group, a C_2–C_7 alkoxycarbonyl group, a C_2–C_7, alkanoyloxy group, a C_2–C_7 alkanoylamino group, a C_2–C_7 N-alkylcarbamoyl group, a C_1–C_6 alkylsulfonyl group, a phenylcarbamoyl group, a N,N-di(C_1–C_6 alkyl) sulfamoyl group, an amino group, a mono(C_1–C_6 alkyl)amino group, a di(C_1–C_6 alkyl)amino group, a benzylamino group, a C_2–C_7 (alkoxycarbonyl)amino group, a C_1–C_6 (alkylsulfonyl)amino group, or a bis(C_1–C_6 alkylsulfonyl)amino group, wherein the substituent for the phenyl group, C_3–C_8 cycloalkyl group, C_3–C_8 cycloalkenyl group, benzyl group, aromatic heterocyclic group, or condensed ring is optionally substituted with one or more of a halogen atom, a cyano group, a hydroxy group, an amino group, a trifluoromethyl group, a C_1–C_6 alkyl group, a C_1–C_6 alkoxy group, a C_1–C_6 alkylthio group, a mono(C_1–C_6 alkyl)amino group, or a di(C_1–C_6 alkyl)amino group with the

proviso that when k=2, m=2, n=0, and R^1 is an unsubstituted phenyl group, then 1) C_1–C_6 alkyl group as a substituent for the phenyl group, C_3–C_8 cycloalkyl group, C_3–C_8 cycloalkenyl group, benzyl group, aromatic heterocyclic group, or condensed ring in R^6 is not substituted with amino group, and 2) R^6 is not a benzyl group.

US 6,410,567 B1

PESTICIDE CONTAINING A PHOTOSENSITIZER AND AN ATTRACTANT

Giulio Jori, Padova, Italy, assignor to Guilio Jori, Padova, Italy; Moshe Schaffer, and Alexander Holtz, both of Munich, Germany

PCT No. PCT/EP97/00791, § 371 Date Dec. 17, 1998, § 102(e) Date Dec. 17, 1998, PCT Pub. No. WO97/29637, PCT Pub. Date Aug. 21, 1997

PCT Filed Feb. 19, 1997, Appl. No. 125,441

Claims priority, application Germany, Feb. 19, 1996, 196 06 082

Int. Cl. A01N *43/36;43/42;43/90;43/30;61/00*

U.S. Cl. 514—333 **6 Claims**

1. A pesticide comprising at least one photosensitizer and a biological and/or chemical attractant for the pest to be killed, the at least one photosensitizer being a porphyrin selected from the group consisting of meso-tri(4N-methyl-pyridyl)-monophenylporphine and meso-diphenyl-di(4N-methyl-pyridyl)porphine.

US 6,410,568 B1

PORPHYRINS AND THEIR USE AS PHOTOSENSITIZER

Stanislaw Schastak, Zschortau, Germany; Alexander Shulga, Minsk, Belarus; Frieder Berr, and Peter Wiedemann, both of Leipzig, Germany, assignors to Astrid Schastak, Zschortau, Germany

PCT No. PCT/EP99/02228, § 371 Date Dec. 15, 2000, § 102(e) Date Dec. 15, 2000, PCT Pub. No. WO99/50269, PCT Pub. Date Oct. 7, 1999

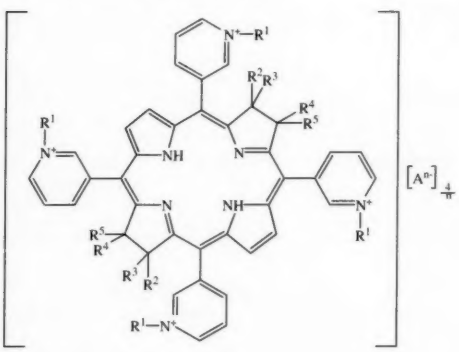
PCT Filed Mar. 31, 1999, Appl. No. 647,239

Claims priority, application Germany, Mar. 31, 1998, 198 14 405

Int. Cl. C07D *487/22;* **A61K** *31/409*

U.S. Cl. 514—333 **10 Claims**

1. A compound of the general formula:



in which:

R^1 is C_1 to C_6 alkyl or aryl,

R^2 to R^5 independently of each other are H, OH, C_1 to C_6 alkyl, C_1 to C_6 alkylene or OR^6, R^6 being C_1 to C_6 alkyl or aryl,

A^{n-} is an anion and

n is 1 or 2.

US 6,410,569 B1

SALT FORM OF PANTOPRAZOLE

Bernhard Kohl, Constance, Germany, assignor to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany

PCT No. PCT/EP99/05928, § 371 Date Feb. 8, 2001, § 102(e) Date Feb. 8, 2001, PCT Pub. No. WO00/10995, PCT Pub. Date Mar. 2, 2000

PCT Filed Aug. 12, 1999, Appl. No. 762,303

Claims priority, application Germany, Aug. 18, 1998, 198 43 413

Int. Cl. C07D *401/12;* **A61K** *31/44*

U.S. Cl. 514—338 **8 Claims**

1. A compound pantoprazole magnesium dihydrate.

US 6,410,570 B1

METHODS OF INACTIVATING A VIRUS AND CONTROLLING VIRAL REPLICATION

Jose A. Fernandez-Pol, Chesterfield, Mo., assignor to Novactyl, Inc., St. Louis, Mo.

Continuation of application No. 09/127,620, filed on Aug. 1, 1998, now Pat. No. 6,127,393, which is a continuation-in-part of application No. 08/843,157, filed on Apr. 11, 1997, now abandoned, which is a continuation-in-part of application No. 08/581,351, filed on Dec. 29, 1995, now Pat. No. 5,767,135, Provisional application No. 60/024,221, filed on Oct. 22, 1996, Provisional application No. 60/026,992, filed on Sep. 20, 1996.

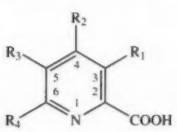
This application Sep. 8, 2000, Appl. No. 657,989.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *31/44;* **C12N** *7/06*

U.S. Cl. 514—354 **25 Claims**

1. A method of inactivating a virus containing a metal-protein complex comprising the step of exposing said virus to a metal chelating agent so that the metal chelating agent chelates said metal within said metal-protein complex so as to denature said protein and inactivate the virus, wherein said metal chelating agent is represented by the following structure:



or a pharmacologically acceptable salt thereof,

wherein R_1, R_2, R_3 and R_4 are selected from the group consisting of a peptide of sixteen amino acids, carboxyl group, methyl group, ethyl group, propyl group, isopropyl group, butyl group, isobutyl group, secondary butyl group, tertiary butyl group, pentyl group, isopentyl group, neopentyl group, fluorine, chlorine, bromine, iodine, and hydrogen;

wherein said metal chelating agent is not a zinc-picolinate complex prior to exposure to said virus.

US 6,410,571 B1

HETEROCYCLIC CARBOXAMIDE-CONTAINING THIOUREA INHIBITORS OF HERPES VIRUSES CONTAINING A SUBSTITUTED PHENYLENEDIAMINE GROUP

Jonathan Bloom; Kevin Curran, both of Nyack; Martin DiGrandi, Congers; Russell Dushin, Garrison; Thomas Jones, New City; Stanley Lang, Blauvent; Adma Ross, Suffern, all of N.Y.; Eugene A. Terefenko, Quakertown, Pa., and Bryan O'Hara, Norwood, N.J., assignors to American Home Products Corporation, Madison, N.J.

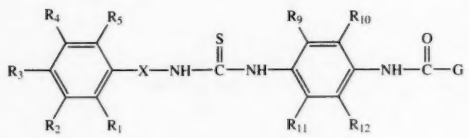
Division of application No. 09/444,782, filed on Nov. 22, 1999, now Pat. No. 6,166,028, Provisional application No. 60/150,698, filed on Dec. 9, 1998, Provisional application No. 60/155,240, filed on Dec. 9, 1998, Provisional application No. 60/155,192, filed on Dec. 9, 1998, Provisional application No. 60/150,692, filed on Dec. 9, 1998, Provisional application No. 60/228,805, filed on Dec. 9, 1998, Provisional application No. 60/228,808, filed on Dec. 9, 1998, Provisional application No. 60/228,809, filed on Dec. 9, 1998. This application Dec. 29, 2000, Appl. No. 684,773.

Int. Cl. A61K *31/44;* **C07D** *213/89;213/90*

U.S. Cl. 514—354 **17 Claims**

1. A compound of the formula:

I



wherein

R_1–R_5 are independently selected from hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, perhaloalkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 10 carbon atoms, aryl, halogen, —CN, —NO_2, —CO_2R_6, —COR_6, —OR_6, —SR_6, —SOR_6, —SO_2R_6, —$CONR_7R_8$, —$NR_6N(R_7R_8)$, —$N(R_7R_8)$ or W—Y—$(CH_2)_n$—Z provided that at least one of R_1–R_5 is not hydrogen;

R_6 and R_7 are independently hydrogen, alkyl of 1 to 6 carbon atoms, perhaloalkyl of 1 to 6 carbon atoms, or aryl;

R_8 is hydrogen, alkyl of 1 to 6 carbon atoms, perhaloalkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 10 carbon atoms, or aryl;

R_9–R_{12} are independently hydrogen, alkyl of 1 to 4 carbon atoms, perhaloalkyl of 1 to 4 carbon atoms, halogen, alkoxy of 1 to 4 carbon atoms, or cyano, or R_9 and R_{10} or R_{11} and R_{12} may be taken together to form aryl of 5 to 7 carbon atoms; provided that at least one of $R_{9\text{-}12}$ is not hydrogen;

W is O, NR_6, or is absent;

Y is —(CO)— or —(CO_2)—, or is absent;

Z is alkyl of 1 to 4 carbon atoms, —CN, —CO_2R_6, COR_6, —$CONR_7R_8$, —$OCOR_6$, —NR_6COR_7, —$OCONR_6$, —OR_6, —SR_6, —SOR_6, —SO_2R_6, SR6N(R7R8), —$N(R_7R_8)$ or phenyl;

G is a six membered monocyclic heteroaryl containing 5 carbons and one nitrogen;

X is a bond, —NH, alkyl of 1 to 6 carbon atoms, alkenyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, or thioalkyl of 1 to 6 carbon atoms, alkylamino of 1 to 6 carbon atoms, or (CH)J;

J is alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, phenyl or benzyl; and

n is an integer from 1 to 6, or pharmaceutical acceptable salts thereof.

US 6,410,572 B1

FUNGICIDAL MIXTURES BASED ON AMIDE COMPOUNDS AND TETRACHLOROISOPHTHALONITRILE

Klaus Schelberger, Gönnheim; Maria Scherer, Landau; Karl Eicken, Wachenheim; Manfred Hampel, Neustadt; Eberhard Ammermann, Heppenheim; Gisela Lorenz, Neustadt, and Siegfried Strathmann, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP98/08226, § 371 Date Jun. 19, 2000, § 102(e) Date Jun. 19, 2000, PCT Pub. No. WO99/31983, PCT Pub. Date Jul. 1, 1999

PCT Filed Dec. 15, 1998, Appl. No. 581,795

Int. Cl. A01N *43/40;37/34*

U.S. Cl. 514—355 **17 Claims**

1. A fungicidal composition comprising as active components

a) an amide compound of formula I

$$A—CO—NR^1R^2 \qquad I$$

in which

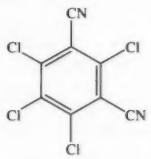
A is pyridyl which is unsubstituted or carries 1, 2 or 3 substituents selected from alkyl, halogen, difluoromethyl and trifluoromethyl;

R^1 is hydrogen;

R^2 is phenyl which optionally carries 1, 2 or 3 substituents selected from alkyl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkynyloxy, cycloalkyl, cycloalkenyl, cycloalkyloxy, cycloalkenyloxy, phenyl and halogen, where the aliphatic and cycloaliphatic radicals are unsubstituted or partially or fully halogenated, the cycloaliphatic radicals are optionally substituted by from 1 to 3 alkyl groups, and the phenyl group is unsubstituted of carries from 1 to 5 halogen atoms and/or from 1 to 3 substituents selected from alkyl, haloalkyl, alkoxy, haloalkoxy, alkylthio and haloalkylthio, and where the amidic phenyl group is optionally condensed with a saturated 5-membered ring which is unsubstituted or substituted by one or more alkyl groups, and

b) a compound of formula II

(II)



wherein the active components are present in synergistically effective amounts.

US 6,410,573 B1

2,5-SUBSTITUTED BENZOLSULFONYLUREAS AND THIOUREAS METHODS FOR THE PRODUCTION THEREOF USE THEREOF AND PHARMACEUTICAL PREPARATIONS CONTAINING THE SAME

Holger Heitsch, Mainz-Kastel; Heinrich Christian Englert, Hofheim, and Heinz Gögelein, Frankfurt am Main, all of Germany, assignors to Aventis Pharma Deutschland GmbH, Frankfurt am Main, Germany

PCT No. PCT/EP99/04643, § 371 Date Jan. 16, 2001, § 102(e) Date Jan. 16, 2001, PCT Pub. No. WO00/03978, PCT Pub. Date Jan. 27, 2000

PCT Filed Jul. 3, 1999, Appl. No. 743,715

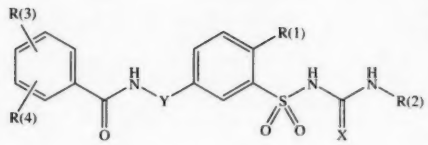
Claims priority, application Germany, Jul. 16, 1998, 198 32 009

Int. Cl. A61K *31/44;31/38;31/34;31/175;* **C07D** *333/22*

U.S. Cl. 514—357 **11 Claims**

1. A compound of the formula I

I



in any stereoisomeric form, or a physiologically tolerable salt thereof, or a mixture thereof in any ratio, in which

X is oxygen or sulfur;

Y is —$(CR(5)_2)_n$—;

R(1) is

a) phenyl which is unsubstituted or is substituted by one or two identical or different substituents independently representing halogen, (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, —$S(O)_m$—(C_1–C_4)-alkyl, phenyl, amino, hydroxyl, nitro, trifluoromethyl, cyano, hydroxycarbonyl, carbamoyl, (C_1–C_4)-alkoxycarbonyl or formyl; or

b) naphthyl; or

c) monocyclic or bicyclic heteroaryl having one ring heteroatom representing oxygen, sulfur or nitrogen; or

d) —$S(O)_m$-phenyl; or

e) (C_2–C_5)-alkenyl which is unsubstituted or is substituted by a radical representing phenyl, cyano, hydroxycarbonyl or (C_1–C_4)-alkoxycarbonyl; or

f) (C_2–C_5)-alkynyl which is unsubstituted or is substituted by a radical representing phenyl or (C_1–C_4)-alkoxy;

R(2) is hydrogen or (C_1–C_3)-alkyl;

R(3) and R(4) independently of one another are hydrogen, halogen or (C_1–C_4)-alkoxy;

the radicals R(5), which are all independent of one another and can be identical or different, are hydrogen or (C_1–C_3)-alkyl;

m is 0, 1 or 2;

n is 1, 2, 3 or 4.

US 6,410,574 B2

FUNGICIDAL COMPOSITION AND METHOD FOR USING THE SAME

Tsutomu Nishiguchi; Tsuyoshi Takemoto, both of Kawachinagano; Sohkichi Tajima, Osaka, and Yoshinobu Yamamoto, Kawachinagano, all of Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan

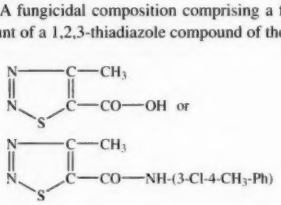
Filed Jul. 28, 1999, Appl. No. 362,087

Claims priority, application Japan, Jul. 30, 1998, 10-229403

Int. Cl. A01N *43/828;37/00;43/00;47/00;55/02*

U.S. Cl. 514—361 **3 Claims**

1. A fungicidal composition comprising a fungicidally effective amount of a 1,2,3-thiadiazole compound of the following structure:



and a compound having fungicidal activity selected from the group consisting of isoprothiolane, tricyclazole, azoxystrobin, propiconazole, 8-hydroxyquinoline-copper, oxolinic acid and benomyl.

US 6,410,575 B2

VIRAL TREATMENT

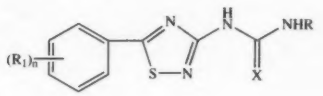
James Berger Camden, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of application No. 09/535,172, filed on Mar. 27, 2000, now Pat. No. 6,258,831, which is a continuation-in-part of application No. 09/281,896, filed on Mar. 31, 1999, now abandoned. This application Mar. 19, 2001, Appl. No. 812,094.

Int. Cl. A61K *31/433*

U.S. Cl. 514—361 **18 Claims**

1. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a therapeutically effective amount of a (5-aryl-1,2,4-thiadiazol)-3-yl thiourea derivative having the formula



wherein

X is sulfur;

R is hydrogen or alkyl having from 1 to 3 carbon atoms;

n is 0–4; and

R_1 is hydrogen, alkyl having from 1 to 7 carbon atoms, chloro, bromo, fluoro, oxychloro or alkoxy having the formula —$O(CH2)_yCH_3$ wherein y is from 1 to 6; and wherein said pharmaceutical composition comprises from about 1 mg to about 10,000 mg of said (5-aryl-1,2,4-thiadiazol)-3-yl thiourea derivative.

US 6,410,576 B1

THIAZOLIDINE DERIVATIVES

Kazuo Nishimura; Ken-ichi Fujimura, both of Osaka; Junzo Matsumoto, deceased, late of Ashiya, by Eiko Matsumoto legal representative, and Tadayuki Kobayashi, Osaka, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP99/04017, § 371 Date Jan. 29, 2001, § 102(e) Date Jan. 29, 2001, PCT Pub. No. WO00/06594, PCT Pub. Date Feb. 10, 2000

PCT Filed Jul. 27, 1999, Appl. No. 744,710

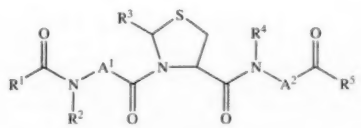
Claims priority, application Japan, Jul. 28, 1998, 10-212368

Int. Cl. A61K *31/425;31/445;31/495;* **C07D** *277/04;401/00*

U.S. Cl. 514—365 **12 Claims**

1. A compound of formula [I] or a salt thereof,

[I]



wherein R^1 is lower alkyl, lower alkoxy, lower alkoxy-lower alkyl, phenyl, phenyl-lower alkyl, phenyl-lower alkoxy, phenoxy, phenoxy-lower alkyl, amino, lower alkylamino or a nonaromatic heterocycle,

R^2 is hydrogen or lower alkyl or R^2 joins with A^1 through the carbon or sulfur to form a nonaromatic heterocycle,

R^3 is hydrogen, lower alkyl or phenyl or R^3 joins with A^1 through the carbon to form a nonaromatic heterocycle,

R^4 is hydrogen or lower alkyl,

R^5 is lower alkyl, halogeno-lower alkyl, hydroxy, lower alkoxy, phenyl, phenyl-lower alkoxy, phenoxy, carboxyl, lower alkoxycarbonyl, phenyl-lower alkoxycarbonyl or an aromatic heterocycle,

A^1 is lower alkylene, wherein the lower alkylene is unsubstituted or substituted by hydroxy, lower alkoxy, phenyl, phe-

noxy, carboxyl, lower alkoxycarbonyl, phenyl-lower alkoxycarbonyl or an aromatic heterocycle, provided that A^1 is not CH(OH),

A^2 is lower alkylene substituted by phenyl,

each said nonaromatic heterocycle is unsubstituted or substituted by lower alkyl, phenyl, phenyl-lower alkyl, amino, lower alkylamino or phenyl-lower alkylamino, and each said nonaromatic heterocycle is selected from the group consisting of pyrrolidine, piperidine, homopiperidine, octahydroazocine, pyrroline, piperazine, imidazolidine, imidazoline, pyrazolidine, pyrazoline, oxazolidine and thiazolidine,

said aromatic heterocycle is selected from the group consisting of pyrrole, indole, isoindole, imidazole, pyrazole, oxazole, isoxazole, benzoxazole, thiazole, isothiazole, benzothiazole, pyridine, quinoline and pyrazine,

each phenyl ring of said phenyl, said phenyl-lower alkyl, said phenyl-lower alkoxy, said phenoxy, said phenoxy-lower alkyl and said phenyl-lower alkoxycarbonyl is unsubstituted or substituted by halogen, lower alkyl, hydroxy, lower alkoxy, phenyl, phenoxy, carboxyl, lower alkoxycarbonyl, amino, lower alkylamino, nitro or cyano,

each lower alkyl moiety of said lower alkylamino is unsubstituted or substituted by phenyl, amino or lower alkylamino.

US 6,410,577 B2

SUBSTITUTED 8,8A-DIHYDRO-3AH-INDENO[1,2-D]THIAZOLES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS MEDICAMENTS

Gerhard Jaehne, Frankfurt; Hans-Jochen Lang; Matthias Gossel, both of Hofheim, and Martin Bickel, Bad Homburg, all of Germany, assignors to Aventis Pharma Deutschland GmbH, Frankfurt, Germany

Filed Feb. 23, 2001, Appl. No. 790,905

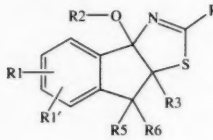
Claims priority, application Germany, Feb. 23, 2000, 100 08 274

Int. Cl. C07D *277/60;* **A61K** *31/425*

U.S. Cl. 514—366 **32 Claims**

1. A compound of formula (I):

(I)



in which

R1, R1' are independently selected from H, F, Cl, Br, I, CF_3, NO_2, CN, COOH, $COO(C_1–C_6)$-alkyl, $CONH_2$, $CONH(C_1–C_6)$-alkyl, $CON[(C_1–C_6)\text{-alkyl}]_2$, $(C_1–C_6)$-alkyl, $(C_2–C_6)$-alkenyl, $(C_2–C_6)$-alkynyl, $O\text{-}(C_1–C_6)$-alkyl,

wherein one or more of the hydrogens of the alkyl, alkenyl, or alkynyl radicals may be replaced by fluorine, or one hydrogen may be replaced by OH, $OC(O)CH_3$, OC(O)H, O—CH_2—Ph, NH_2, NH—CO—CH_3 or $N(COOCH_2Ph)_2$;

SO_2—NH_2, $SO_2NH(C_1–C_6)$-alkyl, $SO_2N[(C_1–C_6)\text{-alkyl}]_2$, S—$(C_1–C_6)$-alkyl, S— $(CH_2)_n$-phenyl, SO—$(C_1–C_6)$-alkyl, SO—$(CH_2)_n$-phenyl, SO_2—$(C_1–C_6)$-alkyl, SO_2 —$(CH_2)_n$-phenyl,

wherein n is 0–6 and the phenyl radical may be substituted up to two times by F, Cl, Br, OH, CF_3, NO_2, CN, OCF_3, O—$(C_1–C_6)$-alkyl, $(C_1–C_6)$-alkyl or NH_2;

NH_2, NH—$(C_1–C_6)$-alkyl, $N[(C_1–C_6)\text{-alkyl}]_2$, $NH(C_1–C_7)$-acyl, phenyl, biphenylyl, O—$(CH_2)_n$-phenyl, where n is 0–6, 1- or 2-naphthyl, 2-, 3- or 4-pyridyl, 2- or 3-furanyl or 2- or 3-thienyl,

wherein any of the phenyl, biphenyl, naphthyl, pyridyl, furanyl or thienyl rings may be optionally substituted one to 3 times by F, Cl, Br, I, OH, CF_3, NO_2, CN, OCF_3, O—$(C_1–C_6)$-alkyl, $(C_1–C_6)$-alkyl, NH_2, NH$(C_1–C_6)$-alkyl, $N[(C_1–C_6)\text{-alkyl}]_2$, SO_2—CH_3, COOH, COO—$(C_1–C_6)$-alkyl or $CONH_2$;

1,2,3-triazol-5-yl, wherein the triazole ring may be substituted in the 1-, 2- or 3-position by methyl or benzyl; tetrazol-5-yl, where the tetrazole ring may be substituted in the 1- or 2 -position by methyl or benzyl; 1,3,4-oxadiazol-2-yl; 2-amino-1,3,4-oxadiazol-5-yl,

wherein the amino function may be mono- or disubstituted by $(C_1–C_6)$-alkyl, —C(O)—$(C_1–C_6)$-alkyl, —C(O)—(cyclo-$C_3–C_7$)-alkyl, —C(O)-phenyl, —C(O)—NH—$(C_1–C_6)$-alkyl, —C(O)—NH—(cyclo-$C_3–C_7$)-alkyl, or —C(O)—NH-aryl, wherein aryl is phenyl, 2-, 3- or 4-pyridyl, 2- or 3-thienyl or 2- or 3-furanyl,

—C(O)-morpholin-4-yl, —C(O)-piperidin-1-yl, —C(O)-piperazin-4-yl, —C(O)—1-methyl-, 1-benzyl-piperazin-4-yl, —SO_2—$(C_1–C_6)$-alkyl or —SO_2-phenyl,

wherein the phenyl ring may be substituted up to two times by F, Cl, Br, CN, CF_3, OH, OCF_3, $(C_1–C_6)$-alkyl, O—$(C_1–C_6)$-alkyl, $(CH_2)_n$-phenyl, O—$(CH_2)_n$-phenyl, where n is 0–6, NH_2, $NH(C_1–C_6)$-alkyl, $N[(C_1–C_6)\text{-alkyl}]_2$, SO_2—CH_3, COOH, COO—$(C_1–C_6)$-alkyl or $CONH_2$;

R2 is H, $(C_1–C_6)$-alkyl, $(C_3–C_6)$-cycloalkyl, $(CH_2)_n$-phenyl, $(CH_2)_n$-thienyl, $(CH_2)_n$-pyridyl, $(CH_2)_n$-furyl, C(O)—$(C_1–C_6)$-alkyl, C(O)—$(C_3–C_6)$-cycloalkyl, C(O)—$(CH_2)_n$-phenyl, C(O)—$(CH_2)_n$-thienyl, C(O)—$(CH_2)_n$-pyridyl or C(O)— $(CH_2)_n$-furyl,

wherein n is 0–5 and in which any of phenyl, thienyl, pyridyl or furyl may be optionally substituted up to two times by Cl, F, CN, CF_3, $(C_1–C_3)$-alkyl, OH or O—$(C_1–C_6)$-alkyl;

R3 is H, $(C_1–C_6)$-alkyl, F, Cl, Br, CN, N_3, O—$(C_1–C_6)$-alkyl, $(CH_2)_n$-phenyl, $(CH_2)_n$-thienyl, $(CH_2)_n$-pyridyl, $(CH_2)_n$-furyl, where n is 0–5 and in which any of phenyl, thienyl, pyridyl or furyl may be optionally substituted up to two times by Cl, F, CN, CF_3, $(C_1–C_3)$-alkyl, OH or O—$(C_1–C_6)$-alkyl,

$(C_2–C_6)$-alkynyl, $(C_2–C_6)$-alkenyl, $OC(O)CH_3$, $(CH_2)_n$—$C(O)O(C_1–C_6)$-alkyl, $(CH_2)_n$—C(O)OH, $(CH_2)_n$—$C(O)NH_2$, $(CH_2)_n$—$C(O)NHCH_3$ or $(CH_2)_n$ —$C(O)N(CH_3)_2$, where n is 0–3;

R4 is $(C_1–C_8)$-alkyl, $(C_3–C_7)$-cycloalkyl, $(C_2–C_6)$-alkenyl, $(C_2–C_6)$-alkynyl, $(C_4–C_7)$-cycloalkenyl,

wherein one or more of the hydrogens of the alkyl radicals may be replaced by fluorine or one hydrogen may be replaced by OH, $OC(O)CH_3$, OC(O)H, O—CH_2—Ph or O—$(C_1–C_4)$-alkyl; is $(CH_2)_n$-pyrrolidin-1-yl, $(CH_2)_n$-piperidin-1-yl, $(CH_2)_n$-morpholin-4-yl, $(CH_2)_n$-piperazin-1-yl, $(CH_2)_n$-N-4-methylpiperazin-1-yl, $(CH_2)_n$—N-4-benzylpiperazin-1-yl, $(CH_2)_n$-phthalimidoyl, where n is 1–6;

$(CH_2)_n$-aryl or $(CH_2)_n$-heteroaryl,

where n is 0–6 and aryl is phenyl, biphenylyl or 1- or 2-naphthyl and heteroaryl is 2-, 3- or 4-pyridyl, 2- or 3-thienyl, 2- or 3-furyl, 2-, 4- or 5-thiazolyl, 2-, 4- or 5-oxazolyl, 1-pyrazolyl, 3- or 5-isoxazolyl, 2- or 3-pyrrolyl, 2- or 3-pyridazinyl, 2-, 4- or 5-pyrimidinyl, 2-pyrazinyl, 2-(1,3,5-triazinyl), 2- or 5-benzimidazolyl, 2-benzothiazolyl, 1,2,4-triazol-3-yl, 1,2,4-triazol-5-yl, tetrazol-5-yl, indol-3-yl, indol-5-yl or N-methylimidazol-2-, -4- or -5-yl,

wherein the aryl radical or the heteroaryl radical may be optionally substituted up to two times by F, Cl, Br, OH, CF_3, NO_2, CN, OCF_3, O—$(C_1–C_6)$-alkyl, S—$(C_1–C_6)$-alkyl, SO—$(C_1–C_6)$-alkyl, $(CH_2)_n$—SO_2—$(C_1–C_6)$-alkyl, $(CH_2)_n$—SO_2—NH_2, $(CH_2)_n$—SO_2 —N(=CH—$N(CH_3)_2$), wherein n is 0–6, $(C_1–C_6)$-alkyl, $(C_3–C_6)$-cycloalkyl, COOH, $COO(C_1–C_6)$-alkyl, $COO(C_3–C_6)$-cycloalkyl, $CONH_2$, $CONH(C_1–C_6)$-alkyl, $CON[(C_1–C_6)\text{-alkyl}]_2$, $CONH(C_3–C_6)$-cycloalkyl, NH_2, NH—CO—$(C_1–C_6)$-alkyl, NH—CO-phenyl, NH—SO_2-$(C_1–C_6)$-alkyl, NH—SO_2-phenyl,

wherein the phenyl ring may be substituted up to two times by F, Cl, CN, OH, $(C_1–C_6)$-alkyl, O—$(C_1–C_6)$-alkyl, CF_3, COOH, $COO(C_1–C_6)$-alkyl or $CONH_2$;

pyrrolidin-1-yl, morpholin-1-yl, piperidin-1-yl, piperazin-1-yl, 4-methylpiperazin-1-yl, $(CH_2)_n$-phenyl, O—$(CH_2)_n$-phenyl, S— $(CH_2)_n$-phenyl or SO_2—$(CH_2)_n$-phenyl, wherein n is 0–3;

$(CH_2)_n$—A—R8, wherein n is 1–6;

A is O, NH, N—$(C_1$–$C_6)$-alkyl, NCHO, N(CO—CH_3), S, SO or SO_2;

R8 is $(C_1$–$C_8)$-alkyl, $(C_3$–$C_8)$-cycloalkyl,

wherein one or more hydrogens of the alkyl radicals may be replaced by fluorine or one hydrogen may be replaced by OH, $OC(O)CH_3$, OC(O)H, O—CH_2—Ph or O—$(C_1$–$C_4)$-alkyl; is $(CH_2)_m$-aryl,

wherein m is 0–6 and aryl is phenyl, thienyl or pyridyl and the aryl moiety may be optionally substituted up to two times by F, Cl, Br, OH, CF_3, NO_2, CN, OCF_3, O—$(C_1$–$C_6)$-alkyl, S—$(C_1$–$C_6)$-alkyl, SO—$(C_1$–$C_6)$-alkyl, $(CH_2)_n$—SO_2—$(C_1$–$C_6)$-alkyl, $(CH_2)_n$—SO_2—NH_2, $(CH_2)_n$—SO_2—N(=CH—$N(CH_3)_2$), $(CH_2)_n$—SO_2—NH(C_1 –C_8)-alkyl, $(CH_2)_n$—SO_2—N[$(C_1$–$C_8)$-alkyl]$_2$, $(CH_2)_n$—SO_2 —NH$(C_3$–$C_8)$-cycloalkyl, $(CH_2)_n$—SO_2—N[$(C_3$–$C_8)$-cycloalkyl$_2$], where n is 0–6, $(C_1$–$C_6)$-alkyl, $(C_3$–$C_6)$-cycloalkyl, COOH, COO-$(C_1$–$C_6)$-alkyl, COO$(C_3$–$C_6)$-cycloalkyl, $CONH_2$, CONH$(C_1$–$C_6)$-alkyl, CON[$(C_1$–$C_6)$-alkyl]$_2$, CONH-$(C_3$–$C_6)$-cycloalkyl, NH_2, NH$(C_1$ –$C_6)$-alkyl, N[$(C_1$–$C_6)$-alkyl]$_2$, NH—CO—$(C_1$–$C_6)$-alkyl, NH—CO-phenyl, NH—SO_2-phenyl,

where the phenyl ring may be optionally substituted up to two times by F, Cl, CN, OH, $(C_1$–$C_6)$-alkyl, O—$(C_1$ –$C_6)$-alkyl, CF_3, COOH, COO$(C_1$–$C_6)$-alkyl or $CONH_2$;

NH—SO_2—$(C_1$–$C_8)$-alkyl, N$(C_1$–$C_6)$-alkyl-SO_2—$(C_1$–$C_8)$-alkyl, pyrrolidin-1-yl, morpholin-1-yl, piperidin-1-yl, piperazin-1-yl, 4-methylpiperazin-1-yl, $(CH_2)_p$-phenyl, O—$(CH_2)_p$-phenyl, S— $(CH_2)_p$-phenyl or SO_2—$(CH_2)_p$-phenyl, wherein p is 0–3;

R5 is H;

R6 is Cl, Br, OH, O—$(C_1$–$C_6)$-alkyl, O—$(CH_2)_n$-aryl, O—$(CH_2)_n$-heteroaryl

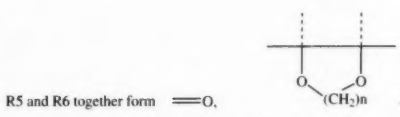
wherein n is 0–6 and aryl is phenyl and heteroaryl is 2-, 3- or 4-pyridyl or 2- or 3-thienyl;

O—C(O)—H, O—C(O)—$(C_1$–$C_6)$-alkyl, O—C(O)—$(C_3$–$C_8)$-cycloalkyl, O—C(O)-aryl, O—C(O)-heteroaryl,

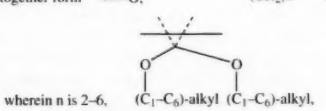
wherein aryl is phenyl and heteroaryl is pyridyl, thienyl or furanyl;

O-alpha- or -beta-glucuronic acid, SH, S—$(C_1$–$C_6)$-alkyl, S—$(CH_2)_n$-phenyl, wherein n is 0–6, S—C(O)—$(C_1$–$C_6)$-alkyl, S—C(O)—$(C_3$–$C_8)$-cycloalkyl, S—C(O)-phenyl; SO—$(C_1$–$C_6)$-alkyl, SO—$(CH_2)_n$-phenyl, wherein n is 0–6, SO_2—$(C_1$–$C_6)$-alkyl, SO_2—$(CH_2)_n$-phenyl, wherein n is 0–6, NH_2, NH—$(C_1$–$C_6)$-alkyl, NH—$(C_3$–$C_7)$-cycloalkyl, N[$(C_1$–$C_6)$-alkyl]$_2$, morpholin-4-yl, pyrrolidin-1-yl, piperidin-1-yl, piperazin-1-yl, 1-methylpiperazin-4-yl, 1-benzylpiperazin-4-yl, NH-phenyl, NH—CH_2-phenyl, NH—C(O)—$(C_1$–$C_6)$-alkyl or NH—C(O)-phenyl;

or

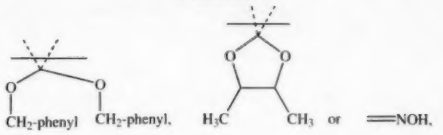


R5 and R6 together form =O,



wherein n is 2–6, $(C_1$–$C_6)$-alkyl $(C_1$–$C_6)$-alkyl,

-continued



and their physiologically acceptable salts and physiologically functional derivatives.

US 6,410,578 B1

BENZAZOLE COMPOUNDS AND THEIR USE

Jacques Bouvier, Neuchatel; Catherine Christinaz, Gletterens, both of Switzerland, and Olivier Froelich, Kembs, France, assignors to Novartis Animal Health US, Inc., Greensboro, N.C.

Filed Oct. 27, 2000, Appl. No. 699,274

Claims priority, application Switzerland, Jun. 18, 1998, 1320/98

Int. Cl. A61K *31/428;31/423;* **A61P** *33/14;* **A01N** *43/78;43/76*

U.S. Cl. 514—367 **5 Claims**

1. A method for controlling insect, mite or tick infestation on warm-blooded animals, comprising the step of topically applying to said animals a composition comprising a compound selected from the group consisting of 2-ethyl-5-methoxy-6-isothiocyanatobenzothiazole, 2-t-butyl-5-methoxy-6-isothiocyanatobenzothiazole, 5-amino-2-methylbenzothiazole, 2-(2-dimethylaminoethenyl)benzothiazole, 2-propionylbenzothiazole, 4-chloro-2-methylbenzothiazole, 5,6-dimethoxy-2-methylbenzothiazole, 2-methylnaphtho[1,2-d]thiazole, 6-methoxy-2-methylbenzothiazole, 5-trifluoromethylsulphonyl-2-methylbenzothiazole, 6-benzoyl-(2H)-benzoxazolone and 3-acetyl-6-fluoro-(2H)-benzoxazolone.

US 6,410,579 B2

USE OF PRAMIPEXOLE FOR THE TREATMENT OF ADDICTIVE DISORDERS

Robert Clyde Marshall, Mattawan; Erik Ho Fong Wong, Portage, and Philip F. Von Voigtlander, Plainwell, all of Mich., assignors to Pharmacia & Upjohn Company, Kalamazoo, Mich.

Provisional application No. 60/184,242, filed on Feb. 23, 2000. This application Feb. 14, 2001, Appl. No. 783,656.

Int. Cl. A61K *31/425*

U.S. Cl. 514—367 **14 Claims**

1. A method of treating or enhancing the treatment of a disorder selected from, addictive disorders, psychoactive substance use disorders, intoxication disorders, inhalation disorders, alcohol addiction, tobacco addiction and nicotine addiction comprising:

administering a therapeutically effective, nontoxic dose of a compound selected from the group consisting of pramipexole, an (−)-enantiomer of pramipexole, pramipexole dihydrochloride, pramipexole dihydrochloride-(H_2O), and a pharmaceutically acceptable salt of any said compound to a patient, wherein said compound is administered orally or by inhalation.

US 6,410,580 B1

SULFONYLAMINO DERIVATIVES WHICH INHIBIT MATRIX-DEGRADING METALLOPROTEINASES

Paivi Jaana Kukkola, Whitehouse Station, N.J.; Leslie Ann Robinson, Del Mar, Calif.; Junichi Sakaki, Kawasaki, and Motowo Nakajima, Ashiya, both of Japan, assignors to Novartis AG, Basel, Switzerland

PCT No. PCT/EP99/00646, § 371 Date Aug. 2, 2000, § 102(e) Date Aug. 2, 2000, PCT Pub. No. WO99/42443, PCT Pub. Date Aug. 26, 1999

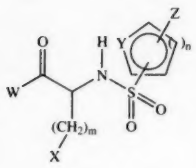
PCT Filed Feb. 2, 1999, Appl. No. 601,462

Int. Cl. C07D *275/06;409/02;* A61K *31/40;* A61P *25/00*

U.S. Cl. 514—373 14 Claims

1. A compound of formula I

(I)



wherein:

W is —OH or —NHOH;

X is

an unsubstituted or substituted heterocyclic radical, selected from the group consisting of pyrrolidinyl, pyrrolyl, pyrazolyl, pyrazolinyl, imidazolinyl, imidazolidinyl, oxazolyl, oxazolidinyl, isoxazolinyl, isoxazolyl, thiazolyl, thiadiazolyl, thiazolidinyl, isothiazolyl, isothiazolidinyl, furyl, tetrahydrofuryl, oxadiazolyl, 2-oxopyrrolodinyl, 1,3-dioxolane, tetrahydro-1,1-dioxothienyl, benzothiazolyl, benzoxazolyl, benzimidazolyl, indolizinyl, benzofuryl, indazolyl, pyrrolopyridyl, furopyridinyl and dihydrobenzoisothiazolyl;

with the proviso that when X is a nitrogen containing heterocyclic radical, the heterocyclic radical is attached to the $(CH_2)_m$ moiety by a ring nitrogen and the proviso that nitrogen and sulfur heteroatoms of the heterocyclic radical may also be oxidized;

Y is oxygen or sulfur;

Z is optionally substituted alkyl; aryl; optionally substituted alkoxy; aryloxy; aralkoxyaryl; aralkoxyheteroaryl; heteroaryl, heterocyclyl, heteroaryloxy, —$CONR'_2R'_3$, —$NR'_1COR'_2$, —$NR'_1CONR'_2R'_3$, —$OCONR'_2R'_3$, —$NR'_1COOR'_4$, or —$SO_2R'_2$, in which

R'_1 is hydrogen, optionally substituted alkyl, heterocyclylalkyl, aralkyl or heteroarylalkyl and

R'_2 and R'_3 are independently hydrogen, optionally substituted alkyl, heterocyclylalkyl, aralkyl, heteroarylalkyl, aryl or heteroaryl; or

R'_2 and R'_3 taken together with the nitrogen atom to which they are attached form a 5- to 7-membered ring, which may optionally contain another heteroatom selected from oxygen, nitrogen and sulfur;

R_4 is optionally substituted alkyl, heterocyclylalkyl, aralkyl, aryl or heteroaryl;

m represents an integer from one to six; and

n represents the integer one;

or a pharmaceutically acceptable salt thereof.

US 6,410,581 B1

DISUBSTITUTED BIPHENYLOXAZOLINES

Udo Kraatz, Leverkusen; Wolfgang Krämer, Burscheid; Albrecht Marhold, Leverkusen; Christoph Erdelen, Leichlingen; Ulrike Wachendorff-Neumann, Neuwied; Andreas Turberg, Haan, and Norbert Mencke, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP98/00973, § 371 Date Aug. 23, 1999, § 102(e) Date Aug. 23, 1999, PCT Pub. No. WO98/39310, PCT Pub. Date Sep. 11, 1998

PCT Filed Feb. 20, 1998, Appl. No. 367,981

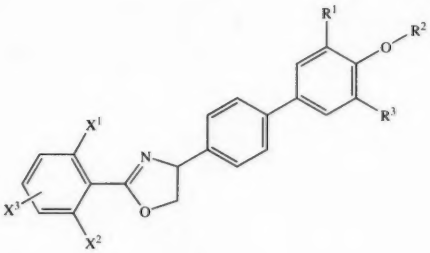
Claims priority, application Germany, Mar. 5, 1997, 197 08 923; May 2, 1997, 197 18 522; Dec. 22, 1997, 197 57 223

Int. Cl. A01N *43/76;* C07D *263/12*

U.S. Cl. 514—374 12 Claims

1. A compound of the Formula (I)

(I)



wherein

X1 represents hydrogen, fluorine, chlorine, bromine, iodine, C_1–C_6-alkyl, C_1–C_6-alkoxy or C_1–C_6-alkylthio,

X2 represents fluorine, chlorine, bromine, iodine, C_1–C_6-alkyl, C_1–C_6-alkoxy or C_1–C_6-alkylthio,

X3 represents hydrogen, fluorine, chlorine, C_1–C_6-alkyl or C_1–C_6-alkoxy,

R1 represents hydrogen, fluorine, chlorine, bromine, C_1–C_6-alkyl or —CH_2—CR4=CH_2,

R2 represents C_1–C_8-alkyl, C_1–C_6-hydroxyalkyl, C_3–C_{10}-alkenyl, C_3–C_{12}-alkinyl, or represents unsubstituted or halogen- or C_1–C_4-alkyl-substituted C_3–C_6-cycloalkyl or C_4–C_6-cycloalkenyl, or

represents unsubstituted or halogen-, C_1–C_4-alkyl-, C_2–C_4-alkenyl-, C_2–C_4-halogenoalkenyl-, phenyl-, halogenophenyl-, styryl- or halogenostyryl-substituted C_3–C_6-cycloalkyl-C_1–C_4-alkyl, or represents unsubstituted or halogen- or C_1–C_4-alkyl-substituted C_4–C_8-cycloalkenyl-C_1–C_2-alkyl,

or represents phenyl-C_1–C_4-alkyl which is unsubstituted or mono- to tetrasubstituted by identical or different substituents from the group consisting of nitro, halogen, C_1–C_{12}-alkyl, C_1–C_{12}-halogenoalkyl, C_1–C_{12}-alkylthio, C_1–C_{12}-halogenoalkylthio, C_1–C_{12}-alkoxy and C_1–C_{12}-halogenoalkoxy, or

represents naphthyl-C_1–C_3-alkyl or tetrahydronaphthyl-C_1–C_3-alkyl,

R3 represents hydrogen, C_1–C_4-alkyl, fluorine, chlorine, bromine or represents —CH_2—CR4=CH_2, wherein R1 and R3 do not simultaneously represent hydrogen, and

R4 represents hydrogen, C_1–C_{12}-alkyl or represents phenyl which is unsubstituted or mono- to tetrasubstituted by identical or different substituents from the group consisting of halogen, C_1–C_{12}-alkyl, C_1–C_{12}-halogenoalkyl, C_1–C_{12}-alkoxy and C_1–C_{12}-halogenoalkoxy.

US 6,410,582 B1

THIENYLAZOLYLALCOXYETHANAMINES, THEIR PREPARATION AND THEIR APPLICATION AS MEDICAMENTS

Ramon Merce-Vidal; Blas Andaluz-Mataro, and Jordi Frigola-Constansa, all of Barcelona, Spain, assignors to Laboratorios Del Dr. Esteve, S.A., Barcelona, Spain

PCT No. PCT/ES99/00098, § 371 Date Oct. 12, 2000, § 102(e) Date Oct. 12, 2000, PCT Pub. No. WO99/52525, PCT Pub. Date Oct. 21, 1999

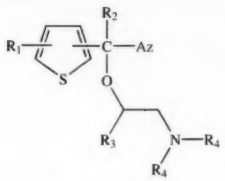
PCT Filed Apr. 15, 1999, Appl. No. 673,186

Claims priority, application Spain, Apr. 15, 1998, 9800793

Int. Cl. A61K *31/41;31/415;* **C07D** *257/00;249/08;231/10*

U.S. Cl. 514—397 **6 Claims**

1. A thienylazolylalkoxyethanamine of the formula (I)

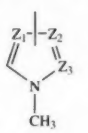


in which

R1 is a hydrogen or halogen atom, or an alkyl radical of 1 to 4 carbon atoms;

R2, R3 and R4 represent, independently, an atom of hydrogen or an alkyl radical of 1 to 4 carbon atoms; and

Az represents a nitrogenated heterocyclic aromatic five-member ring, N-methyl substituted, that contains from one to three atoms of nitrogen, of formula (III)



in which Z1, Z2 and Z3, independently, represent an atom of nitrogen or CH, or a physiologically acceptable salt thereof.

US 6,410,583 B1

CYCLOPENTANOINDOLES, COMPOSITIONS CONTAINING SUCH COMPOUNDS AND METHODS OF TREATMENT

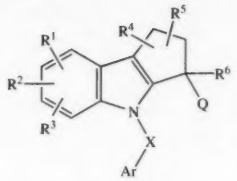
Marc Labelle, Burlingame, Calif.; Claudio Sturino, Dorval, Canada; Bruno Roy, Ile Bizard, Canada; Carl Berthelette, Ste-Dorothee Laval, Canada; Michael Boyd, Montreal, Canada; Nicolas Lachance, Pierrefonds, Canada, and John Scheigetz, Dollard des Ormeaux, Canada, assignors to Merck Frosst Canada & Co., Kirkland, Canada

Provisional application No. 60/220,683, filed on Jul. 25, 2000. This application Jul. 20, 2001, Appl. No. 909,636.

Int. Cl. A61K *31/403;* **C07D** *209/58*

U.S. Cl. 514—411 **15 Claims**

1. A compound of formula I:



I

and pharmaceutically acceptable salts, hydrates and esters thereof, wherein:

R^1, R^2 and R^3 are each independently selected from the group consisting of:
(1) hydrogen, and
(2) R^c,

R^4 and R^5 are each independently selected from the group consisting of:
(1) H,
(2) F,
(3) CN,
(4) C_{1-6}alkyl,
(5) OR^a, and
(6) $S(O)_nC_{1-6}$alkyl,
wherein each of said alkyl group is optionally substituted with halogen, or

R^4 and R^5 on the same carbon atom may represent an oxo, or

R^4 and R^5 on the same carbon atom or on adjacent carbon atoms taken together form a 3- or 4-membered ring containing 0 or 1 heteroatom selected from N, S, or O optionally substituted with one or two groups selected from F, CF_3 and CH_3;

R^6 is selected from the group consisting of:
(1) H,
(2) C_{1-6}alkyl optionally substituted with one to six groups independently selected from $OR^a$and halogen, and
(3) heterocyclyl optionally substituted with one to four halogen; or

R^5 and R^6 attached on adjacent carbon atoms together form a 3- or 4-membered ring containing 0 or 1 heteroatom selected from N, S, or O optionally substituted with one or two groups selected from F, CF_3 and CH_3;

X is selected from the group consisting of: C═O, SO_2, and C_{1-4}alkyl wherein said alkyl is optionally substituted with one to six halogen;

Ar is phenyl each optionally substituted with one to four groups independently selected from R^c;

Q is C_{1-6}alkyl substituted with COOH or tetrazolyl, or

Q and R^6 together form a 3- or 4-membered ring optionally containing a heteroatom selected from N, S, and O, and optionally substituted with one or two groups independently selected from:
(1) halogen,
(2) oxo,
(3) OR^a,
(4) COOH,
(5) $C(O)NHSO_2R^7$, and
(6) tetrazolyl,

R^7 is selected from the group consisting of:
(1) C_{1-6}alkyl optionally substituted with one to six halogen,
(2) aryl, and
(3) heteroaryl,
wherein said aryl and heteroaryl are optionally substituted with halogen, OC_{1-5}alkyl, C_{1-5}alkyl and wherein said alkyl is optionally substituted with one to six halogen;

R^a and R^b are independently selected from hydrogen and C_{1-6}alkyl optionally substituted with one to six halogen;

R^c is
(1) halogen,
(2) CN,
(3) C_{1-6}alkyl optionally substituted with one to six groups independently selected from halogen, NR^aR^b, $C(O)R^a$, $C(OR^a)R^aR^b$, and OR^a,

(4) C_{2-6}alkenyl optionally substituted with one to six groups independently selected from halogen and OR^a,
(5) heterocyclyl,
(6) aryl,
(7) heteroaryl,
(8) $C(O)R^a$,
(9) $C(OR^a)R^aR^b$,
(10) $C(O)OR^a$,
(11) $CONR^aR^b$,
(12) $OCONR^aR^b$,
(13) $S(O)_nR^7$,
(14) $NR^aC(O)OC_{1-6}$alkyl, wherein alkyl is optionally substituted with one to six halogen and
(15) $S(O)_nNR^aR^b$,
wherein heterocyclyl, aryl, heteroaryl are optionally substituted with one to four groups independently selected from halogen;
n is 1, 1 or 2.

US 6,410,584 B1

METHOD FOR INHIBITING NEOPLASTIC CELLS WITH INDOLE DERIVATIVES

Rifat Pamukcu, Spring House, and Gary A. Piazza, Doylestown, both of Pa., assignors to Cell Pathways, Inc., Horsham, Pa.

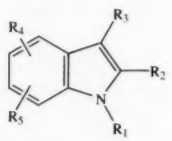
Continuation-in-part of application No. 09/007,098, filed on Jan. 14, 1998, now Pat. No. 6,046,199. This application Nov. 25, 1998, Appl. No. 199,860.

Int. Cl. A61K *31/40*

U.S. Cl. 514—416 **2 Claims**

1. A method for inhibiting the growth of neoplastic cells sensitive to the compounds of formula I comprising exposing the cells to a growth inhibiting effective amount of a compound of Formula I:

(I)



wherein R_1 to R_3 each represent;
(1) a hydrogen atom,
(2) a lower alkyl group, a lower alkylthio group, or a lower alkoxy-lower alkyl group, with the proviso that R_1 to R_3 are not simultaneously hydrogen atoms; or
R_4 is selected from the group consisting of hydrogen atom or lower alkyl;
R_5 is selected from the group consisting of carboxyl, an esterified carboxyl group, or an amidated carboxyl group.

US 6,410,585 B1

INHIBITORS OF PROTEIN TYROSINE PHOSPHATASE

Scott D. Larsen, 56 Naples Ct., Kalamazoo, Mich. 49009; Paul D. May, 7890 N. 32nd St., Richland, Mich. 49083; John E. Bleasdale, 3230 Lites End Ct., Portage, Mich. 49024; Charlotta Liljebris, Torpkäller.33, S-74192 Knivsta, Sweden; Heinrich Josef Schostarez, 3236 Lost Pine Way, Portage, Mich. 49024; Tjeerd Barf, Vikingagatan 32, S-753 34 Uppsala, and Marianne Nilsson, PL 2654 Ubby, SE-762 94 Rimbo, both of Sweden

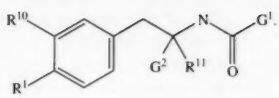
Continuation-in-part of application No. 09/138,642, filed on Aug. 24, 1998, Provisional application No. 60/057,730, filed on Aug. 28, 1997. This application Mar. 10, 1999, Appl. No. 265,410.

Int. Cl. C07C *235/00;237/22;* **A61K** *31/165*

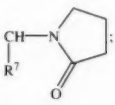
U.S. Cl. 514—424 **10 Claims**

1. Compounds of formula I

I



wherein G^1 is
a) $—R^2$;
wherein G^2 is
c) CH_2OH;
wherein R^1 is
a) $—OSO_3H$,
b) $—OCH(CO_2R^5)_2$,
c) $—OCH_2(CO_2R^5)$,
d) $—OCH(CO_2R^5)CH_2CO_2R^5$,
e) $—OC(CO_2R^5)=CHCO_2R^5$,
f) $—CH_2CH(CO_2R^5)_2$,
g) $—CH=C(CO_2R^5)_2$,
h) $—OCH_2CONHOH$,
i) $—N(CH_2CO_2R^5)_2$, or
j) $—OCHF(CO_2R^5)$;
wherein R^2 is
d) $—CH(R^7)NHXR^6$, or
e)



wherein R^5 is
a) —H,
b) $—C_1–C_{10}$ alkyl, or
c) $—C_1–C_5$ alkyl-phenyl;
wherein R^6 is
a) $C_1–C_{10}$ alkyl,
b) $C_0–C_6$ alkyl-G^3,
c) $C_1–C_6$ alkyl $CONH_2$,
d) $C_1–C_6$ alkyl $NHCO_2R^5$,
e) $C_1–C_6$ alkyl-OR^5,
f) $C_1–C_6$ alkyl-$NHSO_2Me$,
g) $C_1–C_6$ alkyl-O—G^3,
h) $C_1–C_6$ alkyl-S—G^3, or
i) $—C_1–C_6$ alkyl-CO_2R^5;
wherein R^7 is
a) —H,
b) $—C_1–C_6$ alkyl-G^3,
c) $—C_1–C_6$ alkyl-CO_2R^5,
d) $C_1–C_6$ alkyl $CONH_2$,
e) $C_1–C_6$ alkyl $NHCO_2R^5$,
f) $C_1–C_{10}$ alkyl,
g) $C_1–C_{10}$ cycloalkyl,
h) $—C_1–C_6$ alkyl-SR, or
i) $—C_1–C_6$ alkyl-$S(=O)R^5$;
wherein G^3 is
a) phenyl substituted by zero (0) to three (3) R^9,
b) naphthyl substituted by zero (0) to three (3) R^9, or
c) het_1 substituted by zero (0) to three (3) R^9;
wherein het_1 is a 5- or 6-membered saturated or unsaturated ring containing from one (1) to four (4) heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur; and including any bicyclic group in which any of the above heterocyclic rings is fused to a benzene ring, $C_3–C_8$ cycloalkyl, or another heterocycle; and optionally, the nitrogen and sulfur heteroatoms may be in oxidized form;
wherein R^9 may be any of the following:
a) $C_1–C_8$ alkyl substituted by zero (0) to three (3) halo,
b) $C_2–C_8$ alkenyl,
c) OH,
d) O—$C_1–C_5$ alkyl,
e) O—$C_0–C_5$ alkyl-phenyl,

e) —$(CH_2)_n$—O—C_1–C_5 alkyl substituted by zero (0) to three (3) hydroxy,
f) —$(CH_2)_n$—O—C_2–C_7 alkenyl substituted by zero (0) to three (3) hydroxy,
g) halo,
h) NH_2,
i) amino-C_1–C_5 alkyl,
j) mono- or di-C_1–C_5 alkylamino,
k) —C(O)—C_1–C_5 alkyl,
l) —CHO,
m) —C(O)—C_0–C_5 alkyl-phenyl,
n) —$COOR^5$,
o) —$CON(R^5)_2$,
p) —C_3–C_7 cycloalkyl,
q) —NO_2,
r) —CN,
s) —SO_3H,
t) —$SO_2N(R_5)_2$,
u) —$O[(CH_2)_2$—$O]_n$—CH_3,
v) —$[CH_2$—$O]_n$—C_1–C_3 alkyl,
w) —$NR^5(CO)$—NR^5,
x) —CF_3,
y) —$NR^5(CO)C_1$–C_5 alkyl,
z) —$N(R^5)$—SO_2—R^5,
a1) —O—C(O)—R^5,
b1) —S(O)—R^5,
c1) —SR^5, or
d1) —SO_2—R^5;

wherein R^{10} is
a) —H,
b) CO_2R^5,
c) CONHOH,
d) 5-tetrazolyl,
e) F, or
f) $OCH_2CO_2R^5$;

wherein R^{11} is
a) H;

wherein X is —CO— or —SO_2— or —CO_2—;

wherein n is zero, one, two or three;

or a pharmaceutically acceptable salt thereof;

provided that when R^{10} is H, R^1 is other than —$OCH_2(CO_2R^5)$.

US 6,410,586 B1

MODULATORS OF PROTEIN TYROSINE PHOSPHATASES (PTPASES)

Niels Peter Hundahl Møller, Copenhagen; Henrik Sune Andersen, Lyngby; Lars Fogh Iversen, Holte; Ole Hvilsted Olsen, Brønshøj; Sven Branner, Lyngby, all of Denmark; Daniel Dale Holsworth; Farid Bakir, both of San Diego, Calif.; Luke Milburn Judge, La Jolla, Calif.; Frank Urban Axe, Escondido, Calif.; Todd Kevin Jones, Solana Beach, Calif.; William Charles Ripka, San Diego, Calif.; Yu Ge, San Diego, Calif., and Roy Teruyuki Uyeda, San Diego, Calif., assignors to Novo Nordisk A/S, Bagsvaerd, Denmark, and Ontogen Corporation, Carlsbad, Calif.

Division of application No. 09/268,490, filed on Mar. 11, 1999, Provisional application No. 60/082,915, filed on Apr. 24, 1998, Provisional application No. 60/093,525, filed on Jul. 21, 1998, Provisional application No. 60/108,747, filed on Nov. 17, 1998. This application Mar. 16, 2001, Appl. No. 810,266.

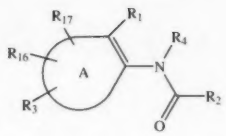
Claims priority, application Denmark, Mar. 12, 1998, 0344/98; Apr. 3, 1998, 1998 00480; Jul. 15, 1998, 1998 00938; Oct. 28, 1998, 1998 01385; Dec. 7, 1998, 1998 01612

Int. Cl. A61K *31/381;31/35;* **C07D** *409/04*

U.S. Cl. 514—443 **7 Claims**

1. A compound of Formula 1

Formula 1



wherein

A is together with the double bond in Formula 1 4,7-dihydro-5H-thieno[2,3-c]pyranyl, 4,7-dihydro-5H-thieno[2,3-c]thiopyranyl, 4,7-dihydro-5H-thieno[2,3-c]thiopyranyl-6-oxide, or 4,7-dihydro-5H-thieno[2,3-c]thiopyranyl-6,6-dioxide;

R_1 is hydrogen, COR_5, OR_6, CF_3, nitro, SO_3H, $PO(OH)_2$, $C(=NH)NH_2$;

R_2 is COR_5, OR_6, CF_3, nitro, cyano, SO_3H, $PO(OH)_2$, or $C(=NH)NH_2$;

R_3, R_{16} and R_{17} are independently hydrogen, C_1–C_6alkyl, aryl, arylC_1–C_6alkyl, oxo, C_1–C_6alkyloxycarbonyl, aryloxycarbonyl, arylC_1–C_6alkyloxycarbonyl, arylC_1–C_6alkyloxy, aryl-C_1–C_6alkyloxyC_1–C_6alkyl, arylC_1–C_6alkylthio, arylC_1–C_6alkylthioC_1–C_6alkyl, arylC_1–C_6alkylaminoC_1–C_6alkyl, di(aryl-C_1–C_6alkyl)aminoC_1–C_6alkyl, arylC_1–C_6alkylcarbonyl, aryl-C_1–C_6alkylcarbonylC_1–C_6alkyl, arylcarboxyC_1–C_6alkyl, aryl-C_1–C_6alkylcarboxy, arylC_1–C_6alkylcarboxyC_1–C_6alkyl, aryl-C_1–C_6alkyl-carbonylamino, arylC_1–C_6alkylcarbonyl-amino-C_1–C_6alkyl, wherein the alkyl and aryl groups are optionally substituted;

R_4 is hydrogen, hydroxy, C_1–C_6alkyl, aryl, arylC_1–C_6alkyl, NR_7R_8, C_1–C_6alkyloxy; wherein the alkyl and aryl groups are optionally substituted;

R_5 is hydroxy C_1–C_6alkyloxy, C_1–C_6alkyl-oxyC_1–C_6alkyloxy, or arylC_1–C_6alkyloxy; wherein the alkyl and aryl groups are optionally substituted;

R_6 is hydrogen;

R_7 and R_8 are independently selected from hydrogen, C_1–C_6alkyl, aryl, arylC_1–C_6alkyl, C_1–C_6alkylcarbonyl, aryl-carbonyl, arylC_1–C_6alkylcarbonyl, C_1–C_6alkylcarboxy or arylC_1–C_6alkylcarboxy wherein the alkyl and aryl groups are optionally substituted; or

R_7 and R_8 are together with the nitrogen to which they are attached forming a saturated, partially saturated or aromatic cyclic, bicyclic or tricyclic ring system containing from 3 to 14 carbon atoms and from 0 to 3 additional heteroatoms selected from nitrogen, oxygen or sulfur, the ring system can optionally be substituted with at least one C_1–C_6alkyl, aryl, arylC_1–C_6alkyl, hydroxy, oxo, C_1–C_6alkyloxy, aryl-C_1–C_6alkyloxy, C_1–C_6alkyloxyC_1–C_6alkyl, NR_9R_{10} or C_1–C_6alkylaminoC$_1$–C_6alkyl, wherein R_9 and R_{10} are independently selected from hydrogen, C_1–C_6alkyl, aryl, aryl-C_1–C_6alkyl, C_1–C_6alkylcarbonyl, arylcarbonyl, aryl-C_1–C_6alkylcarbonyl, C_1–C_6alkylcarboxy or arylC_1–C_6-alkyl-carboxy; wherein the alkyl and aryl groups are optionally substituted; or

R_7 and R_8 are independently a saturated or partial saturated cyclic 5, 6 or 7 membered amine, imide or lactam;

or a salt thereof with a pharmaceutically acceptable acid or base, or any optical isomer or mixture of optical isomers, racemic mixtures, or any tautomeric forms.

US 6,410,587 B1

COMPOUNDS AND THERAPIES FOR THE PREVENTION OF VASCULAR AND NON-VASCULAR PATHOLOGIES

David J. Grainger; James C. Metcalfe, both of Cambridge, United Kingdom, and Sudhakar Kasina, Mercer Island, Wash., assignors to NeoRx Corporation, Seattle, Wash.

Continuation of application No. 09/057,323, filed on Apr. 9, 1998, now Pat. No. 6,117,911, Provisional application No. 60/043,852, filed on Apr. 11, 1997. This application May 5, 2000, Appl. No. 567,558.

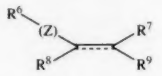
Int. Cl. A61K *31/38;31/135;31/12*

U.S. Cl. 514—445 **35 Claims**

1. A therapeutic method for preventing or treating a condition or

symptom associated with Marfan's syndrome, fibrosis, or senile dementia, comprising administering to a mammal in need of such therapy, an effective amount of a compound of formula VI:

(VI)



wherein

R^6 is $(C_1–C_6)$alkyl, or aryl, optionally substituted by 1, 2, or 3 V;

R^7 is phenyl, optionally substituted by 1, 2, or 3 V; or R^7 is $(C_1–C_{12})$alkyl, halo$(C_1–C_{12})$alkyl, $(C_3–C_6)$cycloalkyl, $(C_1–C_6)$alkylcyclo$(C_1–C_6)$alkyl, $(C_3–C_6)$cycloalkenyl, or $(C_1–C_6)$alkyl$(C_3–C_6)$cycloalkenyl;

R^8 is hydrogen or phenyl, optionally substituted by 1, 2, or 3 V;

R^9 is heteroaryl, heteroaryl$(C_1–C_3)$alkyl, $(C_1–C_4)$alkoxycarbonyl$(C_1–C_6)$alkyl, $(C_1–C_{12})$alkyl, $(C_3–C_6)$cycloalkyl, $(C_1–C_6)$alkylcyclo, $(C_1–C_6)$alkyl, $(C_3–C_6)$cycloalkenyl, or $(C_1–C_6)$alkyl$(C_3–C_6)$cycloalkenyl, wherein any aryl or heteroaryl may optionally be substituted by 1, 2, or 3, V;

— — — — — is a single bond or is —C(B)(D)—, wherein B and D are each independently hydrogen, $(C_1–C_6)$alkyl, or halo;

V is OPO_3H_2, $(C_1–C_6)$alkyl, $(C_1–C_6)$alkoxy, mercapto, $(C_1–C_4)$alkylthio, halo, trifluoromethyl, pentafluoroethyl, nitro, $N(R_n)(R_o)$, cyano, trifluoromethoxy, pentafluoroethoxy, benzoyl, hydroxy, $—(CH_2)_{0-4}C(=O)(C_1–C_6)$alkyl, —U-$(=O)(C_1–C_6)$alkyl, benzyl, $—OSO_2(CH_2)_{0-4}CH_3$, —U-$(CH_2)_{1-4}COOR_p$, $—(CH_2)_{0-4}COOR_p$, $—U(CH_2)_{2-4}OR_p$, $—(CH_2)_{0-4}OR_p$, $—U(CH_2)_{1-4}C(=O)R_k$, $—(CH_2)_{0-4}C(=O)R_k$, $—U(CH_2)_{1-4}R_k$, $—(CH_2)_{0-4}R_k$, or $—U(CH_2)_{2-4}OC(=O)R_p$; wherein U is O, $N(R_m)$, or S;

Z is $—(CH_2)_{1-3}—$, —O—, $—OCH_2—$, $—CH_2O—$, $—C(=O)O—$, $—N(R_q)—$, C=O, or a covalent bond;

R_k is amino, optionally substituted with one or two $(C_1–C_6)$alkyl; or an N-heterocyclic ring optionally containing 1 or 2 additional $N(R_l)$, S, or nonperoxide O, wherein R_1 is H $(C_1–C_6)$alkyl, phenyl, or benzyl;

R_n and R_o are independently hydrogen, $(C_1–C_6)$alkyl, phenyl, benzyl, or $(C_1–C_6)$alkanoyl; or R_n and R_o together with the nitrogen to which they are attached are a 3, 4, 5, or 6 membered heterocyclic ring;

R_p is H or $(C_1–C_6)$alkyl; and

R_m and R_q are independently hydrogen, $(C_1–C_6)$alkyl, phenyl, benzyl, or $(C_1–C_6)$alkanoyl;

the compound is MER25;

or a pharmaceutically acceptable salt thereof.

US 6,410,588 B1

USE OF CANNABINOIDS AS ANTI-INFLAMMATORY AGENTS

Marc Feldmann, London; Anne-Marie Malfait, Surrey, both of United Kingdom; Ruth Gallily, and Raphael Mechoulam, both of Jerusalem, Israel, assignors to The Mathilda and Terence Kennedy Institute of Rheumatology, London, United Kingdom, and Yissum Research and Development Company of the Hebrew University of Jerusalem, Jerulasem, Israel

PCT No. PCT/GB99/01140, § 371 Date Mar. 6, 2001, § 102(e) Date Mar. 6, 2001, PCT Pub. No. WO99/52524, PCT Pub. Date Oct. 21, 1999

PCT Filed Apr. 14, 1999, Appl. No. 673,207

Claims priority, application United Kingdom, Apr. 14, 1998, 9807639

Int. Cl. A61K *31/35*

U.S. Cl. 514—454 **7 Claims**

1. A method of treating a patient suffering from rheumatoid arthritis comprising the step of administering to the patient a pharmaceutically effective amount of cannabidiol.

US 6,410,589 B2

USE OF γ-TOCOPHEROL AND ITS OXIDATIVE METABOLITE LLU-α IN THE TREATMENT OF DISEASE

William J. Wechter, Redlands, Calif., assignor to Loma Linda University Medical Center, Loma Linda, Calif.

Continuation of application No. 09/461,645, filed on Dec. 14, 1999, now Pat. No. 6,242,479, which is a continuation of application No. 09/215,608, filed on Dec. 17, 1998, now Pat. No. 6,048,891. This application Mar. 21, 2001, Appl. No. 814,330.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *31/35*

U.S. Cl. 514—458 **18 Claims**

1. A medicament comprising more than 70% γ-tocopherol, wherein said medicament is in a unit dosage form suitable for pharmaceutical administration.

US 6,410,590 B1

COMPOUNDS HAVING ANTITUMOR ACTIVITY: PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Srinivas Nanduri; Sriram Rajagopal; Sairam Pothukuchi; Sunilkumar Bhadramma Kochunarayana Pillai, and Ranjan Chakrabarti, all of Hyderabad, India, assignors to Dr. Reddy's Research Foundation, Andhra Pradesh, India

Filed Feb. 1, 2001, Appl. No. 775,533

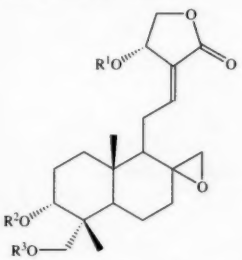
Claims priority, application India, Feb. 3, 2000, 089/MAS/2000

Int. Cl. A61K *31/341*; **C07D** *307/42;307/46*

U.S. Cl. 514—462 **27 Claims**

1. A compound of formula (I)

I



where R^1, R^2 and R^3 are the same or different and independently represent hydrogen or substituted or unsubstituted groups selected from alkyl, aryl, heteroaryl, aralkyl, heteroaralkyl, alkanoyl, alkenoyl, aroyl, heteroaroyl, sulfonyl group or a group —(CO)—W—R^4 where W represents O, S, or NR^5, wherein R^5 represents hydrogen or $(C_1–C_6)$alkyl group, R^4 represents substituted or unsubstituted groups selected from alkyl, aryl, aroyl, or aralkyl or R^2 and R^3 together form a substituted or unsubstituted 3 to 7 membered cyclic structure containing carbon and oxygen atoms; its stereoisomers, its polymorphs, its salts and its solvates.

US 6,410,591 B1

3,7 OR 3 AND 7 THIA OR OXA PROSTANOIC ACID DERIVATIVES AS AGENTS FOR LOWERING INTRAOCULAR PRESSURE

Robert M. Burk; Mark Holoboski, and Mari F. Posner, all of Laguna Niguel, Calif., assignors to Allergan Sales, Inc., Irvine, Calif.

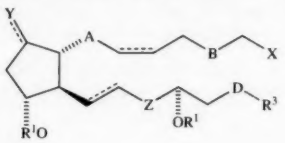
Filed May 8, 2001, Appl. No. 851,296

Int. Cl. A01N *37/08*; **C07C** *405/00;177/00*

U.S. Cl. 514—530 **15 Claims**

1. A method of treating ocular hypertension or glaucoma which comprises administering to an animal having ocular hypertension

or glaucoma a therapeutically effective amount of a compound represented by the general formula I;

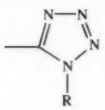


wherein hatched lines represent the α configuration, a triangle represents the β configuration and a dotted line represents the presence or absence of a double bond;

A and B are independently selected from the group consisting of O, S and CH_2, provided that at least one of A or B is S;

D represents a covalent bond or CH_2, O, S or NH;

X is CO_2R, $CONR_2$, CH_2OR, $P(O)(OR)_2$, $CONRSO_2R$, $SONR_2$ or



Y is O, OH, $OCOR^2$, halogen or cyano;

Z is CH_2 or a covalent bond;

R is H or R^2;

R^1 is H, R^2, phenyl, or COR^2;

R^2 is C_1–C_5 lower alkyl and R_3 is C_1–C_5 n-alkyl, C_3–C_7 cycloalkyl, phenyl, furanyl, thienyl, or substituted derivatives thereof, wherein the substituents maybe selected from the group consisting of C_1–C_5 alkyl, halogen, CF_3, CN, NO_2, NR_2, CO_2R and OR.

US 6,410,592 B1

AMINOMETHYLCARBOXYLIC ACID DERIVATIVES

S. G. Gibson; D. R. Jaap, both of Scotland; S. N. Thorn, England, and R. R. Gilfillan, Scotland, all of United Kingdom, assignors to Akzo Nobel N.V., Arnhem, Netherlands

PCT No. PCT/EP99/05477, § 371 Date Jan. 25, 2001, § 102(e) Date Jan. 25, 2001, PCT Pub. No. WO00/07978, PCT Pub. Date Feb. 17, 2000

PCT Filed Jul. 26, 1999, Appl. No. 744,520

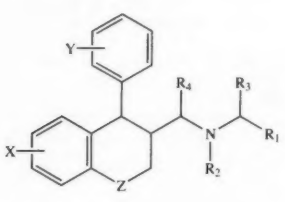
Claims priority, application European Pat. Off., Jul. 31, 1998, 98306149

Int. Cl. A01N *37/12;37/44;43/42;* **A61K** *31/24;31/47*

U.S. Cl. 514—539 **22 Claims**

1. An aminomethylcarboxylic acid derivative having the general formula I

Formula I



wherein

Z is $(CH_2)_n$, O, S, SO, SO_2 or N—R_5;

n is 0, 1 or 2;

X represents 1–3 substituents independently selected from hydrogen, halogen, (C_{1-6})alkyloxy, (C_{3-6})cycloalkyloxy, (C_{6-12})aryloxy, (C_{6-12})aryl, thienyl, SR_6, SOR_6, SO_2R_6, NR_6R_6, NHR_6, NH_2, $NHCOR_6$, NSO_2R_6, CN, $COOR_6$ and (C_{1-4})alkyl, optionally substituted with halogen, (C_{6-12})aryl, (C_{1-6})alkyloxy or (C_{6-12})aryloxy; or 2 substituents at adjacent positions together represent a fused (C_{5-6})aryl group, a fused (C_{5-6})cycloalkyl ring or O—$(CH_2)_m$—O; m is 1 or 2;

Y represents 1–3 substituents independently selected from hydrogen, halogen, (C_{1-4})alkyloxy, SR_6, NR_6R_6 and (C_{1-4})alkyl, optionally substituted with halogen;

R_1 is $COOR_7$ or $CONR_8R_9$;

R_2 and R_6 are (C_{1-4})alkyl;

R_3, R_4 and R_5 are independently hydrogen or (C_{1-4})alkyl;

R_7, R_8 and R_9 are independently hydrogen, (C_{1-4})alkyl, (C_{6-12})aryl or arylalkyl;

or a pharmaceutically acceptable salt thereof.

US 6,410,593 B1

ANTIDANDRUFF COMPOSITIONS

Régine De Mesanstourne, Maisons-Lafitte; Hélène Lebon, Louveciennes, and Hélène Le Gall, Viry Chatillon, all of France, assignors to CECA S.A., Puteaux, France

Continuation of application No. 09/249,310, filed on Feb. 12, 1999, now abandoned. This application Feb. 5, 2001, Appl. No. 775,602.

Claims priority, application France, Feb. 13, 1998, 98 01771

Int. Cl. A61K *31/205*

U.S. Cl. 514—556 **13 Claims**

1. An aqueous antifungal and antidandruff shampoo composition with a washing base comprising:

an anionic surfactant comprising one or more compounds selected from the group consisting of ($C_{10}$to C_{14}) alkyl sulfates, and (C_{10} to C_{14}) alkyl ether sulphates or a mixture thereof;

an amphoteric surfactant comprising one or more compounds selected from the group consisting of alkyl amphocarboxyglycinates, alkyl amphocarboxypropionates, alkyl amphodiacetates, alkyl amphodipropionates, alkyl amphoglycinates, alkyl amphopropionates, alkyl iminopropionates, alkyl iminodipropionates, alkyl amphopropyl sulphonates, alkylbetaines, alkylamidopropylbetaines, alkylsultaines, and alkylamidopropylhydroxysultaines or a mixture thereof; and

a single antifungal agent for providing antifungal activity toward *Pityrosporum ovalae* and antidandruff efficacy, said antifungal agent consisting of undecylenamidopropylbetaine; wherein said undecylenamidopropylbetaine is in an amount as a percent by weight of the aqueous shampoo composition of less than the total of said anionic surfactant plus said amphoteric surfactant without said undecylenamidopropylbetaine.

US 6,410,594 B1

SUBSTITUTED CYCLOPENTANE COMPOUNDS USEFUL AS NEURAMINIDASE INHIBITORS

Yarlagadda S. Babu; Pooran Chand, and John A. Montgomery, all of Birmingham, Ala., assignors to Biocryst Pharmaceuticals, Inc., Birmingham, Ala.

PCT No. PCT/US97/09309, § 371 Date Jun. 9, 1999, § 102(e) Date Jun. 9, 1999, PCT Pub. No. WO97/47194, PCT Pub. Date Dec. 18, 1997

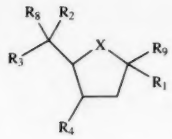
Provisional application No. 60/019,930, filed on Jun. 14, 1996, Provisional application No. 60/044,010, filed on May 2, 1997. This PCT application Jun. 13, 1997, Appl. No. 202,351.

This patent is subject to a terminal disclaimer.

Int. Cl. A61K *31/235*

U.S. Cl. 514—563 **31 Claims**

1. A compound represented by the formula

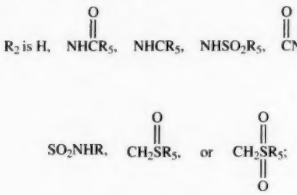


wherein

X is CH_2, O or S

R_1 is H, OH, NH_2, or OR_{11};

R_9 is CO_2H, SO_3H, PO_3H_2, NO_2, esters thereof, or salts thereof;



each of R_3 and R_8 individually is H, $(CH_2)_nCO_2R_{10}$, $(CH_2)_mOR_{10}$, $CON(R_{10})_m$, $(CH_2)_nN(R_{10})_m$, $CH(R_{10})_m$, $(CH_2)_n(R_{10})_m$, $CH_2CH(OR_{10})CH_2OR_{10}$, $CH(OR_{10})CH(OR_{10})CH_2OR_{10}$, CH_2OR_{10}, $CH(OR_{10})CH_2NHR_{10}$, $CH_2CH(OR_{10})CH_2NHR_{10}$, $CH(OR_{10})CH(OR_{10})CH_2NHR_{10}$, or $NR_{10}C(=NR_{10})N(R_{10})_m$;

provided that at least one of R_2, R_3 and R_8 is other than H;

R_4 is $(CH_2)_nOH$, $(CH_2)_nNH_2$, $(CH_2)_nC(=NH)NH_2$, $(CH_2)_nNHC(=NR_7)NH_2$, $(CH_2)_nCN$ or $(CH_2)_nN_3$;

R_5 is H, lower alkyl, branched chain alkyl, cyclic alkyl or CF_3;

R_7 is H, OH, CN, NH_2 or NO_2;

R_{10} is H, lower alkyl, lower alkylene, branched alkyl, cyclic alkyl, substituted cyclic alkyl, $(CH_2)_n$ aromatic, $(CH_2)_n$-substituted aromatic, and when m is 2 both R_{10} groups can also be interconnected to form an N-heterocyclic ring;

R_{11} is lower alkyl, branched alkyl, or $(CH_2)_m$ aromatic;

m is 1 or 2;

n is 0–4;

and further provided that when x is O or S, R_3 and R_8 is other than $CH(OR_{10})CH(OR_{10})CH_2OR_{10}$;

and pharmaceutically acceptable salts thereof.

US 6,410,595 B1

METHODS AND COMPOSITIONS FOR TREATING MALE ERECTILE DYSFUNCTION

Gary W. Neal, Knoxville, Tenn., assignor to Androsolutions, Inc., Knoxville, Tenn.

Continuation of application No. 08/890,445, filed on Jul. 9, 1997, now Pat. No. 6,103,765. This application Oct. 12, 1999, Appl. No. 414,966.

Int. Cl. A61K *31/19;31/35;31/355*

U.S. Cl. 514—573 **24 Claims**

1. A pharmaceutical composition, comprising:

(a) a vasodilator; and

(b) 15-hydroxyprostaglandin dehydrogenase inhibitor;

wherein components (a) and (b) are present in synergistically effective amounts.

US 6,410,596 B1

COMPOSITIONS CONTAINING HYPOGLYCEMICALLY ACTIVE STILLBENOIDS

David C. Hopp, Mill Creek, Wash., and Wayne D. Inman, San Luis Obispo, Calif., assignors to Insmed Incorporated, Glen Allen, Va.

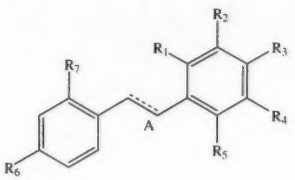
Provisional application No. 60/225,800, filed on Aug. 16, 2000. This application Aug. 2, 2001, Appl. No. 919,966.

Int. Cl. A61K *31/185;31/075*

U.S. Cl. 514—576 **11 Claims**

1. A method of supplementing the diet a mammal suffering from elevated blood glucose levels, comprising administering to said mammal a dietary supplement comprising a carrier and a hypoglycemically effective amount of an isolated compound having the formula (I):

(I)



wherein,

A is selected from the group consisting of a single bond and a double bond in trans conformation;

R_1 is selected from the group consisting of H, OH, C_{1-6}alkoxy, COOH, and $COOC_{1-6}$alkyl;

R_2 is selected from the group consisting of H, OH, and C_{1-10}alkoxy;

R_3 is selected from the group consisting of H, C_{1-10}alkyl, C_{2-10}alkenyl, C_{2-10}alkynyl, and C_{1-8}cycloalkyl;

R_4 is selected from the group consisting of H, OH, and C_{1-10}alkoxy;

R_5 are selected from the group consisting of H, C_{1-10}alkyl, C_{2-10}alkenyl, C_{2-10}alkynyl, and C_{1-8}cycloalkyl;

R_6 is selected from the group consisting of H, OH, C_{1-6}alkoxy, COOH, and $COOC_{1-6}$alkyl;

R_7 is selected from the group consisting of H, OH, C_{1-6}alkoxy, COOH, and $COOC_{1-6}$alkyl; and

wherein, at least one of R_3 and R_5 is selected from the group consisting of C_{1-10}alkyl, C_{2-10}alkenyl, C_{2-10}alkynyl, and C_{1-8}cycloalkyl;

or a pharmaceutically acceptable salt thereof.

US 6,410,597 B1

HYDROXYALKYL AMIDE ANALOGS OF CERAMIDE

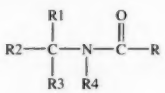
Erhard Bieberich, Richmond; Raphael M. Ottenbrite, Midlothian; Robert K. Yu, Richmond; Helen Fillmore, Richmond, and William C. Broaddus, Richmond, all of Va., assignors to Virginia Commonwealth University, Richmond, Va.

Filed Feb. 25, 2000, Appl. No. 512,597

Int. Cl. A61K *31/16;31/045*

U.S. Cl. 514—625 **4 Claims**

1. A method for treating inflammation in a patient in need thereof comprising administering to said patient a sufficient quantity of a compound of the general formula



wherein

R=a saturated or mono- or polyunsaturated (cis or trans) alkyl group having greater than 5 carbon atoms,

R1, R2 and R3 may be the same or different and are hydroxylated alkyl groups, and

R4 is hydrogen, an alkyl chain having from 1 to 12 carbon atoms, or an aryl moiety, wherein said administering step causes reduction in inflammation in said patient.

US 6,410,598 B1

COMPOSITIONS AND METHODS FOR ADVANCED GLYCOSYLATION ENDPRODUCT-MEDIATED MODULATION OF AMYLOIDOSIS

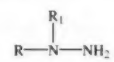
Michael P. Vitek, 205 Park Knoll La., Apex, N.C. 27502; Anthony Cerami, Ram Island Dr., Shelter Island, N.Y. 11964; Richard J. Bucala, 504 E. 63rd St. Apt. 33-0, New York, N.Y. 10021; Peter C. Ulrich, 148 DeWolf Rd., Old Tappan, N.J. 07675; Helen Vlassara, Ram Island Dr., Shelter Island, N.Y. 11964, and Xini Zhang, 150 Fairhaven Dr. Apt. D1, Jericho, N.Y. 11753

Continuation-in-part of application No. 08/457,169, filed on Jun. 1, 1995, which is a continuation-in-part of application No. PCT/US95/01380, filed on Feb. 2, 1995, which is a continuation-in-part of application No. 08/311,768, filed on Sep. 23, 1994, now abandoned, which is a continuation of application No. 08/191,579, filed on Feb. 3, 1994, now abandoned. This application Jun. 7, 1995, Appl. No. 477,364.

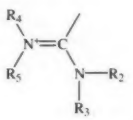
Int. Cl. A01N *37/52;* **A61K** *31/155*

U.S. Cl. 514—632 **5 Claims**

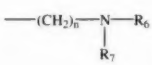
1. A method for inhibiting AGE-amyloid-dependent aggregation of amyloid peptide and consequent amyloidogenesis in mammal comprising administering to sand mammal an effective amyloid aggregating inhibiting amount of an AGE-amyloid formation-inhibiting agent selected from the group consisting of aminoguanidine, α-hydrazinohistidine, lysine, an analog of aminoguanidine, a pharmaceutically acceptable acid addition salt of al analog of aminoguanidine, and mixtures thereof, said analog selected from hydrazine derivatives of the formula:



wherein R is a group of the formula



and R_1 is hydrogen or a lower alkyl group of 1–6 carbon atoms, a hydroxyethyl group, or together with R_2 may be a lower alkylene bridge of 24 carbon atoms; R_2 is hydrogen or a lower group alkyl of 1–6 carbon atoms or together with R_1 or R_3 is a lower alkylene bridge of 2–4 carbon atoms, amino, hydroxy, or an aminoalkylene group of the formula



wherein n is an integer of 2–7 and R_6 and R_7 are independently a lower alkyl group of 1–6 carbon atoms or together form a part of a cycloalkyl or heterocyclic ring containing from 1 to 2 heteroatoms, of which at least one is nitrogen; and the second of said heteroatoms is selected from the group consisting of nitrogen, oxygen, and sulfur, with the proviso that when the second of said heteroatoms of the heterocyclic ring is nitrogen and forms a piperazine ring; said second heteroatom may be optionally substituted by a substituent that is identical to the portion of the compound on the first nitrogen of the piperazine ring; R_3 is hydrogen, a lower alkyl group of 1–6 carbon atoms, or together with R_2 or R_4 is a lower alkylene bridge of 2–4 carbon atoms; R_4 is hydrogen, a lower alkyl group of 1–6 carbon atoms or together with R_3 is a lower alkylene bridge of 2–4 carbon atoms; or an amino group; R_5 is hydrogen, or a lower alkyl group of 1–6 carbon atoms; with the proviso that at least one of R_1, R_2, R_3, R_4 or R_5 is other than hydrogen; or R is an acyl or a lower alkylsulfonyl group of up to 10 carbon atoms and R_1 is hydrogen.

US 6,410,599 B1

ANTISEPTIC COMPOSITIONS SUITABLE FOR APPLICATION TO HUMAN TISSUE

Ron Johnson, 1461 Eastpoint Cir., Sandy, Utah 84092

Continuation of application No. 09/668,953, filed on Sep. 22, 2000, which is a continuation-in-part of application No. 09/401,076, filed on Sep. 22, 1999, now Pat. No. 6,211,243. This application Nov. 6, 2001, Appl. No. 993,178. This patent is subject to a terminal disclaimer.

Int. Cl. A61K *31/155;31/24;31/045*

U.S. Cl. 514—634 **30 Claims**

1. A composition suitable for application to and penetration into a human body to treat disordered tissue, consisting essentially of:

one or more benzalkonium chloride compounds for penetrating into disordered tissue, said one or more benzalkonium chloride compounds having a combined concentration in a range of about 0.01% to about 0.5% by volume of the composition; and

a mixture of water and isopropyl alcohol, the water having a concentration in a range of about 10% to about 50% by volume of the mixture, the balance of the mixture being isopropyl alcohol.

US 6,410,600 B1

AZINE USED AS FUNGICIDES

Dirk Backhaus, Köln; Bernd-Wieland Krüger, Gladbach; Peter Gerdes, Aachen; Herbert Gayer, Monheim; Martin Vaupel, Leichlingen, and Klaus Stenzel, Düsseldorf, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP99/02454, § 371 Date Oct. 19, 2000, § 102(e) Date Oct. 19, 2000, PCT Pub. No. WO99/55665, PCT Pub. Date Nov. 4, 1999

PCT Filed Apr. 12, 1999, Appl. No. 673,758

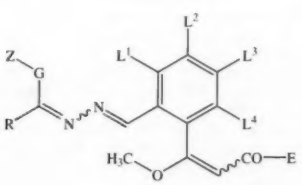
Claims priority, application Germany, Apr. 23, 1998, 198 18 313

Int. Cl. A61K *31/16;* **C07C** *251/00;229/00*

U.S. Cl. 514—638 **10 Claims**

1. Compounds of the formula (I)

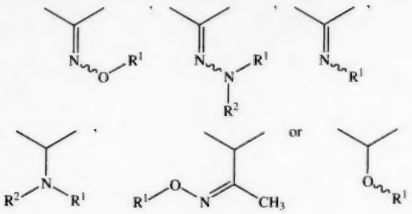
(I)



in which

E represents methoxy, ethoxy, NH_2 or NH—CH_3,

G represents a single bond or a grouping



in which

R^1 and R^2 are identical or different and independently of one another each represents optionally substituted alkyl, alkenyl, alkinyl, aryl, cycloalkyl, alkylcarbonyl or arylcarbonyl,

R represents hydrogen, alkyl or in each case optionally substituted cycloalkyl or aryl,

Z represents cyano, alkoxycarbonyl, alkoxy, cycloalkoxy or in each case optionally substituted alkyl, cycloalkyl, cycloalkylalkyl, aryl, or arylalkyl, and

L^1, L^2, L^3 and L^4 are identical or different and independently of one another each represents hydrogen, halogen, cyano, nitro, in each case optionally halogen-substituted alkyl, alkoxy, alkylthio, alkylsulphinyl or alkylsulphonyl.

a human or a veterinarian preparation wherein astaxanthin is an active ingredient in said preparation, to said males.

US 6,410,601 B2

HISTOCHROME AND ITS THERAPEUTIC USE IN ACUTE MYOCARDIAL INFARCTION AND ISCHEMIC HEART DISEASE

Georgy Borisovich Elyakov; Oleg Borisovich Maximov; Natalya Petrovna Mischenko; Evgenia Alexandrovna Koltsova; Sergei Alexandrovich Fedoreev; Ljutsia Ignatievna Glebko; Natalya Petrovna Krasovskaya, and Alexandr Alexeevich Artjukov, all of Vladivostok, Russian Federation, assignors to Tikhookeansky Institut Bioorganicheskoi Khimii Dalnevostochnogo Otdeleniya Rossiiskoi Akademii Nauk, Vladivostoka, Russian Federation

Continuation of application No. PCT/RU99/00249, filed on Jul. 21, 1999. This application Apr. 12, 2001, Appl. No. 832,864.

Claims priority, application Russian Federation, Oct. 12, 1998, 98118369

Int. Cl. A61K *31/12*

U.S. Cl. 514—682 **8 Claims**

1. A pharmaceutical composition for the treatment of angina pectoris, myocardial infarction, and ischemic heart disease comprising an aqueous solution of di- or tri-sodium salts of echinochrome in an amount of 0.9 to 1.1 percent (w/w).

US 6,410,602 B1

METHOD OF INCREASING THE PRODUCTION AND IMPROVING THE QUALITY OF SEMEN

Ake Lignell, Varmdo; John Inborr, Lidkoping, and Curt Nicolin, Grodinge, all of Sweden, assignors to Astacarotene AB, Gustavsberg, Sweden

PCT No. PCT/SE98/02138, § 371 Date Jun. 6, 2000, § 102(e) Date Jun. 6, 2000, PCT Pub. No. WO99/29313, PCT Pub. Date Jun. 17, 1999

PCT Filed Nov. 26, 1998, Appl. No. 555,514

Claims priority, application Sweden, Dec. 9, 1997, 9704590

Int. Cl. A61P *15/08;* **A61K** *31/122;31/05*

U.S. Cl. 514—689 **6 Claims**

1. A method of increasing the volume, the total sperm count and the reproductive performance of semen from human or animal males, comprising administration of a quality improving dosage of

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US 6,410,603 B1

ACTIVE TOPICAL SKIN PROTECTANTS USING COMBINATIONS OF REACTIVE NANOPARTICLES AND POLYOXOMETALATES OR METAL SALTS

Stephen T. Hobson, Belcamp; Ernest H. Braue, Witeford; Erich K. Lehnert, Rosemont, all of Md.; Kenneth J. Klabunde; Shawn Decker, both of Manhattan, Kans.; Craig L. Hill, Atlanta, Ga.; Jeffrey Rhule, Franklin, Ohio; Eric Boring, Diamondhead, Miss., and Olga Koper, Manhattan, Kans., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.; Nanoscale Materials, Inc., and Emory University, both of Atlanta, Ga.

Provisional application No. 60/209,337, filed on Jun. 2, 2000. This application Jun. 1, 2001, Appl. No. 871,744.

Int. Cl. A61K *31/02;31/08;47/00;7/42*

U.S. Cl. 514—759 **25 Claims**

1. A topical skin protectant formulation for neutralizing chemical warfare agents into less toxic products comprising: a barrier base cream; and one or more polyoxometalate suspended on reactive nanoparticles or metal salt suspended on reactive nanoparticles as an active moiety.

US 6,410,604 B1

ACTIVE TOPICAL SKIN PROTECTANTS CONTAINING OPAA ENZYMES AND CLECS

Ernest H. Braue, Jr., Whiteford; Stephen T. Hobson, Belcamp, both of Md.; Chandrike Govardhan, Lexington, and Nazar Khalaf, Worcester, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Provisional application No. 60/209,337, filed on Jun. 2, 2000. This application Jun. 1, 2001, Appl. No. 871,749.

Int. Cl. A61K *31/02;31/08;47/00;7/42*

U.S. Cl. 514—759 **34 Claims**

1. A topical skin protest formulation for neutralizing chemical warfare agents into less toxic products comprising: barrier base cream; and one or more (OPAA) organophosphorus acid anhydride hydrolase crystals or cross linked enzyme crystals (CLECs) as an active moiety.

US 6,410,605 B1

PROCESS FOR PREPARING EMULSION

Toshiya Shimada; Kouichi Funada; Hidetake Nakamura, and Hideaki Kubo, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Mar. 20, 2000, Appl. No. 531,482

Claims priority, application Japan, Mar. 19, 1999, 11-076602

Int. Cl. B01F *3/12;* **C08F** *2/32;* **C08K** *9/04;9/10*

U.S. Cl. 516—22 **28 Claims**

17. A process for preparing an emulsion containing hydrophilic solid particles, comprising:

mixing a first water-in-oil emulsion with hydrophilic solid particles or a dispersion of hydrophilic solid particles to form a mixture, wherein said first emulsion comprises water droplets; and

applying a shear to the mixture with a shearing machine at a shearing rate of not less than 50×10^3 s^{-1} to form a second water-in-oil emulsion containing hydrophilic solid particles;

wherein the hydrophilic solid particles are present in the second emulsion in an amount of not less than 40% by weight, based on the weight of the second emulsion; and

wherein the water droplets contain the hydrophilic solid particles in the second emulsion.

US 6,410,606 B2

PROCESS FOR PRODUCING NATURAL RUBBER FOR PRESSURE-SENSITIVE ADHESIVE AND NATURAL RUBBER-BASED PRESSURE-SENSITIVE ADHESIVE COMPOSITION

Tomohide Banba; Yoshihiro Minamizaki; Isao Hirose, and Toshiyuki Umehara, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Jan. 24, 2001, Appl. No. 768,211

Claims priority, application Japan, Jan. 24, 2000, 2000-015118

Int. Cl. C08J *3/09;3/00*

U.S. Cl. 521—41 **7 Claims**

1. A process for producing a natural rubber for a pressure-sensitive adhesive, which comprises decreasing a molecular weight of an unmasticated natural rubber by the action of a peptizing agent while dissolving the unmasticated natural rubber in an organic solvent.

US 6,410,607 B1

GLYCOLYSIS PROCESS FOR RECYCLING OF POST-CONSUMER PET

Michael Paul Ekart, Wassenaar, Netherlands; William Speight Murdoch, Jr., and Thomas Michael Pell, Jr., both of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Provisional application No. 60/119,447, filed on Feb. 10, 1999. This application Jan. 5, 2000, Appl. No. 478,018.

Int. Cl. C08J *11/04*

U.S. Cl. 521—48.5 **20 Claims**

1. A depolymerization and purification process comprising:

(a) contacting a contaminated polyester with an amount of a glycol to provide a molar ratio of greater than about 1 to about 5 total glycol units to total dicarboxylic acid units at a temperature between about 150 to about 300° C. and an absolute pressure of about 0.5 to about 3 bars under agitation in a reactor for a time sufficient to produce, in the reactor, an upper layer comprising a relatively low density contaminant floating above a lower layer including a liquid comprising a depolymerized oligomer of said polyester; and

(b) separating, while under said agitation, said upper layer from said lower layer by removing said upper layer from the reactor in a first stream and removing said lower layer from the reactor in a second stream.

US 6,410,608 B1

PROCESS FOR PRODUCING POLYURETHANE FOAM

Mitsuru Sakai; Atsushi Ishikawa, and Masayoshi Morii, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

PCT No. PCT/JP99/04031, § 371 Date Apr. 27, 2001, § 102(e) Date Apr. 27, 2001, PCT Pub. No. WO00/06624, PCT Pub. Date Feb. 10, 2000

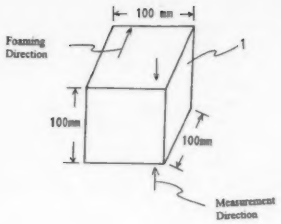
PCT Filed Jul. 28, 1999, Appl. No. 744,917

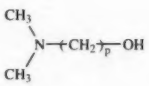
Claims priority, application Japan, Jul. 31, 1998, 10-217208

Int. Cl. C08G *18/14*

U.S. Cl. 521—128 **4 Claims**

1. A process for producing a polyurethane foam comprising reacting a polyol component with an isocyanate component in the presence of a catalyst comprising a compound represented by the formula (I):





(I)

wherein p is an integer of 4 to 8, and a compound having a primary amino group and a tertiary amino group in its molecule represented by the formula (II):

$$R^1R^2N\text{-}(CH_2)_m\text{-}A\text{-}(CH_2)_n\text{-}NH_2 \quad \text{(II)}$$

wherein each of R^1 and R^2 is independently an alkyl group having 1 to 4 carbon atoms, or may be bonded to each other to form a 3- to 6-membered nitrogen-containing heterocyclic group; and when A is oxygen atom, each of m and n is independently an integer of 2 to 6, or when A is a single bond, each of m and n is a positive integer satisfying m+n=2 to 8, a blowing agent and a surfactant.

US 6,410,609 B1

LOW PRESSURE GENERATING POLYURETHANE FOAMS

Anthony James Taylor, Medina, and Reto Faessler, Copley, both of Ohio, assignors to Fomo Products, Inc., Norton, Ohio

Filed Jul. 27, 2000, Appl. No. 626,611

Int. Cl. C08J *9/04*

U.S. Cl. 521—131 **56 Claims**

1. A one-component polyurethane foam comprising:

(a) at least two polyols, a first of said at least two polyols having a number average molecular weight ranging from approximately 400 to 2000, and a second of said at least two polyols having a number average molecular weight ranging from approximately 800 to 4000 wherein said first and second polyols are polyalkylene polyols; and

(b) at least one diisocyanate;

(c) at least one non-ozone depleting blowing agent; and

(d) an amount of pressure build due to post expansion is less than or equal to approximately 2 psig and wherein said foam experiences substantially no contraction over time.

US 6,410,610 B1

METHOD FOR PRODUCING CATIONIC POLYELECTROLYTES

Helmut Brehm, Krefeld, Germany, assignor to Stockhausen GmbH & Co. KG, Krefeld, Germany

PCT No. PCT/EP98/06179, § 371 Date Apr. 26, 2000, § 102(e) Date Apr. 26, 2000, PCT Pub. No. WO99/23120, PCT Pub. Date May 14, 1999

PCT Filed Sep. 29, 1998, Appl. No. 529,406

Claims priority, application Germany, Oct. 31, 1997, 197 48 153

Int. Cl. C08F *2/50;2/46*

U.S. Cl. 522—84 **16 Claims**

1. A process for the production of high molecular weight, water-soluble polyelectrolytes, comprising:

adiabatically photopolymerizing a monomer combination of a non-ionogenic monomer and a cationic monomer in aqueous solution in the presence of an initiator system of:

(A) an initiator which furnishes free radicals upon irradiation with light, and

(B) a redox initiator system, the photopolymerization reaction being initiated upon irradiation of the monomer combination with light, and, as the temperature of the polymerization system increases as polymerization progresses, the redox initiator system initiating polymerization when the temperature reaches 20° C.

US 6,410,611 B1

ACTIVE ENERGY RAY CURABLE COMPOSITION COMPRISED OF A MALEIMIDE DERIVATIVE AND A METHOD FOR CURING THE SAID CURABLE COMPOSITION

Yoshinobu Sakurai, Sakura; Atsushi Miyakawa, Yotsukaido; Hisatomo Yonehara, Sakura; Hidenobu Ishikawa, Ichihara, and Katsuji Takahashi, Sakura, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed May 15, 1998, Appl. No. 79,523

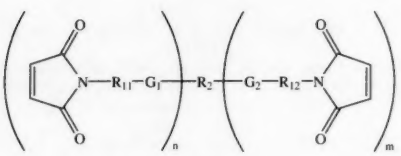
Claims priority, application Japan, May 16, 1997, 9-126970; Aug. 13, 1997, 9-218770; Aug. 19, 1997, 9-222402; Mar. 26, 1998, 10-079678

Int. Cl. C07D *207/448;* **C08F** *2/48*

U.S. Cl. 522—103 **11 Claims**

1. An active energy ray curable composition comprising a maleimide derivative represented by formula (1):

(1)



wherein

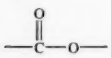
m and n each represent an integer of 1 to 5, and the total of m and n is 6 or smaller, R_{11} and R_{12} each represent a linking group selected from the group consisting of

① an alkylene group,

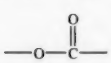
② an alicyclic group, and

③ a cycloalkylalkyene group,

G_1 represents



group and G_2 represents



group, R_2 represents a linking chain having a number average molecular weight of 100 to 100,000 selected from the group consisting of (A) a (poly)ether linking chain and (B) a (poly-)ester linking chain in which at last one organic group selected from the group consisting of

① a straight chain alkylene group having 3–24 carbon atoms,

② a branched alkylene group,

③ an alkylene group having a hydroxyl group, and

④ an alicyclic group,

is connected via at least one linkage selected from the group consisting of (a) an other linkage and (b) an ester linkage where R_2 and G_1 as well as R_2 and G_2 form a carboxylic acid ester linkage.

US 6,410,612 B1

DENTURE REBASES

Kenji Hatanaka, Okayama-ken, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Filed Mar. 3, 2000, Appl. No. 518,137

Claims priority, application Japan, Mar. 3, 1999, 11-054847

Int. Cl. A61K *6/083*

U.S. Cl. 523—115 **20 Claims**

1. A denture rebase, comprising:

(a) an acrylic resin;

(b) a fluoro(meth)acrylate having the formula (I):

$$CH_2=C(R^1)COO-R^2-Rf \quad (I)$$

wherein R^1 represents a hydrogen atom or a methyl group; R^2 represents an alkylene group; Rf represents a perfluoro alkyl group; R^2+Rf has 4 to 10 carbon atoms in total, and wherein at least 50% of all atoms bonded to said carbon atoms constituting R^2+Rf are fluorine atoms;

(c) a polyfunctional (meth)acrylate comprising at least one alkylene glycol di(meth)acrylate wherein the alkylene group is a linear, branched or cyclic alkylene group having 3 to 20 carbon atoms; and

(d) a polymerization initiator.

US 6,410,613 B1

PHOSPHATE COMPOUND AND PREPARATION PROCESS THEREOF, PHOSPHATE COPPER COMPOUND AND PREPARATION PROCESS THEREOF, NEAR INFRARED RAY ABSORBER, AND NEAR INFRARED RAY-ABSORBING ACRYLIC RESIN COMPOSITION

Yasuhiro Ohnishi, Kyoto, and Hiroki Katono, Fukushima, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP98/03757, § 371 Date Feb. 17, 2000, § 102(e) Date Feb. 17, 2000, PCT Pub. No. WO99/10354, PCT Pub. Date Mar. 4, 1999

PCT Filed Aug. 25, 1998, Appl. No. 485,882

Claims priority, application Japan, Aug. 26, 1997, 9-229723; Aug. 26, 1997, 9-229727; Aug. 26, 1997, 9-229731

Int. Cl. G21F *1/10*

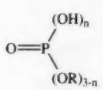
U.S. Cl. 523—136 **12 Claims**

1. A near infrared ray-absorbing synthetic resin composition comprising a synthetic resin, and the following component (A) and/or component (B) dispersed in the synthetic resin:

Component (A): a component composed of a copper ion and a phosphate compound represented by the following formula (1); and/or

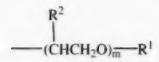
Component (B): a component composed of a compound obtained by reacting a phosphate compound represented by the following formula (1) with a copper salt

Formula (1)

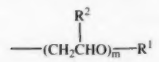


wherein groups R independently mean a group represented by the following formula (2) or (3), and n is 1 or 2:

Formula (2)



Formula (3)



wherein R^1 denotes an alkyl group having 1 to 20 carbon atoms, R^2 represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, and m is an integer of 1 to 6.

US 6,410,614 B1

INCORPORATING TITANIUM DIOXIDE IN POLYMERIC MATERIALS

Frank R. Jones, Asheville; Stanley A. McIntosh, Candler, and Raymond L. Denney, Canton, all of N.C., assignors to BASF Corpotation, Mt. Olive, N.J.

Filed Mar. 3, 2000, Appl. No. 519,061

Int. Cl. C08K *9/00*

U.S. Cl. 523—205 **30 Claims**

1. A flowable titanium dioxide paste composition consisting essentially of:

(a) a polymeric carrier that is a liquid below about 25° C. and which has a molecular weight sufficient for the carrier to exhibit a boiling point of at least about 300° C., wherein said polymeric carrier is at least one selected from the group consisting of (i) polycaprolactone, (ii) poly(adipate ester), and (iii) alkyl polyesters derived from an alkyl diacid monomer which is at least one selected from the group consisting of 1,4-cyclohexane dicarboxylic acid, 1,8-octanoic acid, methylpentanedioic acid and 4-ethyladipic acid, and a diol monomer having two or more carbon atoms;

(b) titanium dioxide particles dispersed in the polymeric carrier in an amount of at least about 55% by weight to about 70% by weight sufficient to achieve a viscosity of the composition which is in the range of about 500 cP to about 500,000 cP at a temperature of about 25° C.;

(c) from 0 to about 5% water by weight of said composition; and optionally,

(d) one or more dispersants.

US 6,410,615 B1

SEMICONDUCTOR SEALING EPOXY RESIN COMPOSITION AND SEMICONDUCTOR DEVICE USING THE SAME

Takashi Taniguchi; Minoru Yamane; Tsutomu Nishioka; Tadaaki Harada; Toshitsugu Hosokawa; Kazuhiro Ikemura; Sadahito Misumi, and Shinichi Ohizumi, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

PCT No. PCT/JP99/02978, § 371 Date Feb. 9, 2000, § 102(e) Date Feb. 9, 2000, PCT Pub. No. WO99/64513, PCT Pub. Date Dec. 16, 1999

PCT Filed Jun. 3, 1999, Appl. No. 485,389

Claims priority, application Japan, Jun. 9, 1998, 10-161107

Int. Cl. C08L *63/00;* **C08K** *3/36;9/10;* **C08G** *59/62;* **H01L** *23/29*

U.S. Cl. 523—211 **5 Claims**

1. An epoxy resin composition for semiconductor encapsulation which comprises an epoxy resin, a phenolic resin, a hardening accelerator and an inorganic filler, said epoxy resin composition having the following properties (X) to (Z):

(X) the viscosity thereof as measured with a flow tester at 175° C. is from 50 to 500 poise;

(Y) the minimum melt viscosity thereof as determined from the temperature dependence of viscosity thereof as measured with a dynamic viscoelastic meter at a shear rate of 5 (1/s) is 1×10^5 poise or lower, and

(Z) the ratio of the viscosity thereof as measured at 90° C. (Z1) to that as measured at 110° C. (Z2) both with a dynamic viscoelastic meter at a shear rate of 5 (1/s), (Z1/Z2), is 2.0 or higher,

wherein the content of the inorganic filler is from 80 to 92% by weight based on the whole epoxy resin composition.

US 6,410,616 B1

CROSSLINKED POLYMER PARTICLE AND ITS PRODUCTION PROCESS AND USE

Nobuyuki Harada, Suita; Masatoshi Nakamura; Shigenori Kirimura, both of Himeji, and Yoshifumi Adachi, Himeji, all of Japan, assignors to Nippon Shokubai Co., LTD, Osaka, Japan

Filed Apr. 7, 1999, Appl. No. 287,509

Claims priority, application Japan, Apr. 9, 1998, 10-097477

Int. Cl. C08J *3/00*

U.S. Cl. 523—337 **4 Claims**

1. A production process for a water-swellable crosslinked polymer particle, comprising the steps of:

forming a water-drop-in-oil type suspension in which liquid drops of a water phase are dispersed in an oil phase by stirring both phases in the presence of a hydrophobic inorganic particle, wherein the water phase includes a hydrophilic high-molecular compound and a crosslinking agent; and

carrying out a crosslinking reaction in a state where the hydrophobic inorganic particle is aggregated on surfaces of liquid drops of the water phase.

US 6,410,617 B1

SELF-DISPERSING, HARDENABLE EPOXY RESINS, PROCESSES FOR PRODUCING THE SAME AND METHODS OF USING THE SAME

Horst Sulzbach; Thomas Huver, both of Duesseldorf; Hans-Josef Thomas, Monheim, all of Germany, and Vincenzo Foglianisi, Milan, Italy, assignors to Cognis Deutschland GmbH, Duesseldorf, Germany

PCT No. PCT/EP99/04454, § 371 Date Apr. 26, 2001, § 102(e) Date Apr. 26, 2001, PCT Pub. No. WO00/02945, PCT Pub. Date Jan. 20, 2000

PCT Filed Jun. 26, 1999, Appl. No. 743,211

Claims priority, application Germany, Jul. 7, 1998, 198 30 282

Int. Cl. C08K *3/20;* **C08L** *63/02*

U.S. Cl. 523—404 **16 Claims**

1. A process for producing self-dispersing, curable, epoxy resins, the process comprising:

(i) reacting (a) one or more α,β-unsaturated carboxylic acid esters of the general formula (I),

$$R^2R^3C{=}C(R^4)COOR^1 \quad (I),$$

with (b) one or more aminopolyalkylene oxide compounds having at least one aminonitrogen atom with one or more reactive hydrogen atoms, wherein R^1 represents a hydrocarbon radical having up to 15 carbon atoms, wherein R^2, R^3, and R^4 each independently represents a substituent selected from the group consisting of hydrogen, hydrocarbon radicals having up to 20 carbon atoms, and $—(CH_2)_n—COOR^1$, wherein R^1 is as defined above and n represents a number of from 0 to 10, and wherein (a) and (b) are present in quantities such that the equivalent ratio of the reactive hydrogen atoms in (b) to the α,βC=C double bonds in (a) is from 10:1 to 1:10, to form an intermediate product Z1 having a number of ester groups;

(ii) reacting the intermediate product Z1 with (c) one or more polyhydroxy compounds having a number of hydroxy groups,

wherein the intermediate product Z1 and the one or more polyhydroxy compounds are present in quantities such that the equivalent ratio of the ester groups to the hydroxy groups is from 1:1.1 to 1:10, to form an intermediate product Z2 having a number of hydroxyl groups; and

(iii) reacting the intermediate product Z2 with (d) one or more polyepoxides having a number of oxirane rings, wherein the intermediate product Z2 and the one or more polyepoxides are present in quantities such that the equivalent ratio of the oxirane rings to the hydroxyl groups is from 1.5:1 to 6:1.

11. A self-dispersing, hardenable epoxy resin, said epoxy resin produced by the process according to claim **1**.

15. An aqueous dispersion comprising a self-dispersing, hardenable epoxy resin according to claim **11**.

US 6,410,618 B2

POLYMERIC COMPOSITE MATERIAL AND METHOD OF MANUFACTURING THE SAME

Masaru Uryu, Chiba, and Kunihiko Tokura, Saitama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of application No. 09/403,718, filed on Oct. 25, 1999, now Pat. No. 6,274,652. This application May 31, 2001, Appl. No. 871,113.

Claims priority, application Japan, Feb. 26, 1998, 10-045903; Feb. 24, 1999, PCT/JP99/00847

Int. Cl. C08L *1/00;99/00;101/00;* **A61L** *15/00;* **C08J** *5/04*

U.S. Cl. 524—27 **10 Claims**

1. A method of manufacturing a biodegradable polymeric composite material comprising:

drying bacterial cellulose having ribbon-shaped micro-fibrils to produce a bacterial cellulose powder;

macerating the bacterial cellulose before of after producing the bacterial cellulose powder;

dehydrating the bacterial cellulose after maceration; and

mixing the bacterial cellulose powder with a biodegradable polymeric material selected from the group consisting essentially of polyhydroxybutyrate/valerate, poly-β-hydroxybutyrate, polycaprolactone, polybutylenesuccinate, polybutylenesuccinate/adipate, polyethylenesuccinate, polylactic acid, starch/synthetic biodegradable plastic, cellulose acetate, chitosan/cellulose and denatured starch,

to produce a biodegradable polymeric composite material.

US 6,410,619 B2

METHOD FOR CONDITIONING ORGANIC PIGMENTS

Michael J. Greene, Mt. Pleasant, S.C.; Patrick F. McIntyre, Bloomfield Hills; James G. King, Birmingham, both of Mich.; Gregory R. Schulz, Mt. Pleasant, S.C., and Karyn B. Visscher, Voorhees, N.J., assignors to Bayer Corporation, Pittsburgh, Pa., and E.I. DuPont De Nemours and Company, Wilmington, Del.

Filed Nov. 22, 1999, Appl. No. 444,589

Int. Cl. C09B *67/50*

U.S. Cl. 524—88 **20 Claims**

1. A process for preparing conditioned organic pigments comprising

(a) wet milling a mixture comprising:

(1) one or more crude organic pigments;

(2) at least about 0.1% by weight, relative to the organic pigment, of one or more acrylic copolymer dispersants; and

(3) a positive amount to about 100 parts by weight, relative to the organic pigment, of a milling liquid in which the organic pigment is substantially insoluble; and

(b) isolating the milled organic pigment.

US 6,410,620 B2

COLOR STABLE COMPOSITIONS CONTAINING ARYLATE-COMPRISING POLYMERS

Alexander Isaakovich Shakhnovich, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of application No. 09/709,987, filed on Nov. 13, 2000, now abandoned, which is a division of application No. 09/394,211, filed on Sep. 10, 1999, now abandoned. This application Mar. 22, 2001, Appl. No. 815,328.

Int. Cl. C08K *5/17;5/3412*

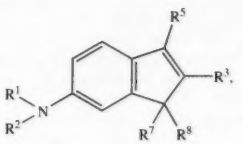
U.S. Cl. 524—89 **50 Claims**

1. A resinous composition comprising the following:

(A) at least one thermoplastic polymer comprising structural units derived from at least one 1,3-dihydroxybenzene and at least one organodicarboxylic acid, and

(B) at least one 4-aminocinnamic compound of the formula

(II)



wherein:

each of R^1 and R^2 is an alkyl radical, or R^1 and R^2 together with the nitrogen atom separating them form a heterocyclic radical;

$R^3$is $COOR^4$, $C(O)R^4$, or CN;

R^4 is hydrogen, alkyl or aryl;

R^5 is hydrogen, alkyl, or aryl; and

each of R^7 and R^8 is hydrogen or an alkyl radical, or R^7 and R^8 together form an alicyclic radical;

said 4-aminocinnamic compound absorbing radiation in the range between about 360 nanometers and about 390 nanometers.

US 6,410,621 B1

FLAME-RETARDANT MOULDED COMPONENT

Lee Hamilton Martin, West Chester, Pa., assignor to T&N Technology Limited, Rugby, United Kingdom

PCT No. PCT/GB97/01171, § 371 Date Oct. 22, 1998, § 102(e) Date Oct. 22, 1998, PCT Pub. No. WO97/42264, PCT Pub. Date Nov. 13, 1997

PCT Filed Apr. 29, 1997, Appl. No. 171,611

Claims priority, application United Kingdom, May 8, 1996, 9609606

Int. Cl. C08K *5/3477;5/521*

U.S. Cl. 524—101 **4 Claims**

1. A flame-retardant nylon monofilament formed by a process comprising the steps of:

compounding a mixture consisting essentially of 5 to 20 weight percent melamine cyanurate and 3 to 10 weight percent of an organopolyphosphonate, with the balance being a polymer selected from the group consisting of Nylon 6, Nylon 12 and Nylon 66; and

extruding as a monofilament said compounded mixture.

US 6,410,622 B1

METHOD OF PREVENTING FOULING ORGANISMS IN MARINE ENVIRONMENTS AND POLYMER-BOUND NITRIC OXIDE/NITRIC OXIDE-RELEASING COMPOSITIONS USABLE THEREFOR

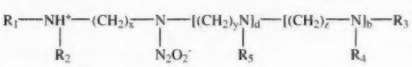
Gregory W. Endres, 1137 Cutler Cir., Saline, Mich. 48176

Filed Sep. 11, 2000, Appl. No. 658,964
Int. Cl. C08K *5/22*
U.S. Cl. 524—189 **20 Claims**

1. A method of preventing fouling organisms in marine environments, comprising the step of:

introducing into the marine environment in a sufficient amount an antifouling composition, wherein the antifouling composition is used as and/or incorporated into at least one of paints, coatings, solutions, emulsions, pellets, powders, and flakes, the antifouling composition having as its effective ingredient a nitric oxide-releasing functional group whereupon nitric oxide is controllably released into the marine environment to prevent at least one of the fouling organisms' propagation, ability to attach, and ability to function;

wherein the nitric oxide-releasing functional group is of the formula:



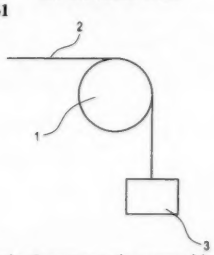
wherein b and d are the same or different and may be zero or one; R_1, R_2, R_3, R_4 and R_5 are the same or different and may be hydrogen, C_{3-8} cycloalkyl, C_{1-12} straight or branched chain alkyl, benzyl, benzoyl, phthaloyl, acetyl, trifluoroacetyl, p-toluyl, t-butoxycarbonyl, or 2,2,2-trichloro-6-butoxycarbonyl; and x, y, and z are the same or different and are integers from 2 to 12.

US 6,410,623 B1

THERMOPLASTIC ELASTOMER RESIN COMPOSITION

Ryoichi Okuda, Tokyo, Japan, assignor to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Jan. 21, 2000, Appl. No. 489,470
Claims priority, application Japan, Jan. 22, 1999, 11-015030
Int. Cl. C08L *47/00*
U.S. Cl. 524—261 **16 Claims**



1. A thermoplastic elastomer resin composition comprising

(a) 100 parts by weight of block polymer composed of at least two polymeric blocks A (primarily vinyl aromatic compounds) and at least one polymeric block B (primarily conjugated diene compounds), wherein said vinyl aromatic compound content falls within the range of 5–70% by weight and at least 70% of said conjugate diene compound portion is hydrogenated;

(b) 50–170 parts by weight of a polyolefin-based resin whose melt flow rate (ASTM-D-1238L condition at 230° C.) is 1–40 g per 10 minutes;

(c) 100–300 parts by weight of a non-aromatic plasticizer for rubber;

(d) 50–170 parts by weight of a thermoplastic elastomer composition containing crystalline polyolefin and completely or partially crosslinked ethylene-α-olefin polymer, wherein said α-olefin polymer density falls in the range of 0.858–0.915 g/cm^3 and the molecular weight distribution (M/Mn) (weight average molecular weight (Mw) over number average molecular weight Mn)) is less than 3.0; and

(e) 5–50 parts by weight of silicone oil whose viscosity (JIS Z8803 at 25° C.) is at least 50,000 centistoke.

US 6,410,624 B1

TIRE WITH TREAD OF NOVEL POLYMER BLEND INCLUDING STYRENE-RICH STYRENE/ISOPRENE/BUTADIENE SEGMENTED TERPOLYMER

Neil Arthur Maly; Paul Harry Sandstrom, both of Tallmadge; Wen-Liang Hsu, Cuyahoga Falls, and Adel Farhan Halasa, Bath, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 14, 1999, Appl. No. 395,446
Int. Cl. C08K *5/24*
U.S. Cl. 524—262 **24 Claims**

1. A rubber composition comprised of, based upon 100 parts by weight rubber (phr), (A) about 25 to about 75 phr of styrene-rich segmented styrene/isoprene/butadiene terpolymer elastomer comprised of styrene/butadiene segments and polyisoprene segments and, correspondingly, about 25 to about 75 phr of at least one additional elastomer selected from at least one of cis 1,4-polyisoprene, styrene/butadiene copolymer, styrene/isoprene copolymer and 3,4-polyisoprene; wherein the content of the styrene/butadiene copolymer segments is in a range of about 15% to about 50% of the terpolymer and, correspondingly, the content of the polyisoprene segments is in a range of about 85% to about 50% of the terpolymer; wherein the styrene/butadiene segments are styrene-rich segments which contain about 20 to about 50 weight percent bound styrene; and wherein said segmented styrene/isoprene/butadiene terpolymer is characterized by having two Tg's, namely a first Tg of said styrene/butadiene segment in a range of about +10° C. to about −30° C. and a second Tg of said polyisoprene segments in a range of about −50° C. to about −70° C. and wherein said first and second Tg's are spaced apart by at least 20° C.

US 6,410,625 B1

ASYMMETRICAL SILOXY COMPOUNDS

Thierry Florent Edme Materne, Attert, Belgium; Rene Jean Zimmer, Howald; Friedrich Visel, Bofferdange, both of Luxembourg; Uwe Ernst Frank, Marpingen, Germany, and Giorgio Agostini, Colmar-Berg, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of application No. 09/033,302, filed on Mar. 2, 1998, now Pat. No. 6,084,014. This application Mar. 24, 2000, Appl. No. 535,484.
Int. Cl. C08J *3/20;* **C08L** *7/00;9/00;11/00;23/00*
U.S. Cl. 524—262 **4 Claims**

1. A method of processing a silica-filled rubber composition which comprises mixing

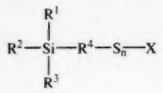
(i) 100 parts by weight of at least one elastomer which is selected from the group consisting of natural rubber, neoprene, polyisoprene, butyl rubber, polybutadiene, styrene-butadiene copolymer, styrene/isoprene/butadiene rubber, methyl methacrylate-butadiene copolymer, isoprene-styrene copolymer, methyl methacrylate-isoprene copolymer, acrylonitrile-isoprene copolymer, acrylonitrile-butadiene copolymer, EPDM and mixtures thereof;

(ii) 10 to 250 phr of particulate precipitated silica;

(iii) 0 to 150 phr of carbon black; and

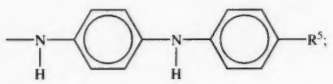
(iv) 0.05 to 10 phr of an asymmetrical siloxy compound of the formula

I

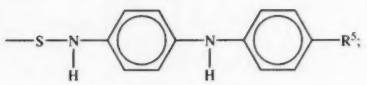


wherein R^1, R^2 and R^3 are independently selected from the group consisting of alkoxy radicals having from 1 to 8 carbon atoms; R^4 is selected from the group consisting of alkylene groups having from 1 to 15 carbon atoms and arylene and alkyl-substituted arylene groups having from 6 to 10 carbon atoms; n is an integer of from 2 to 8 and X is selected from the group consisting of

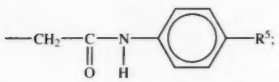
II



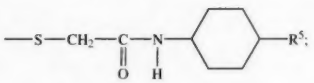
III



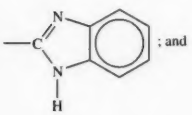
IV

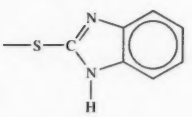


V



VI





and R^5 is selected from the group consisting of alkyl groups having from 1 to 15 carbon atoms, aryl and alkyl substituted aryl groups having 6 to 20 carbon atoms.

US 6,410,626 B1

AQUEOUS DISPERSION COMPOSITION AND COATED ARTICLES

Susumu Wada; Katsuhiko Imoto, and Kayoko Honda, all of Settu, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

PCT No. PCT/JP98/01968, § 371 Date Jan. 4, 2000, § 102(e) Date Jan. 4, 2000, PCT Pub. No. WO98/49230, PCT Pub. Date Nov. 5, 1998

PCT Filed Apr. 30, 1998, Appl. No. 423,070

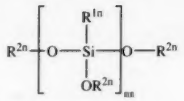
Claims priority, application Japan, Apr. 30, 1997, 9-127968; Jun. 4, 1997, 9-163370

Int. Cl. C08K *5/24*

U.S. Cl. 524—266 **21 Claims**

1. An aqueous dispersion composition which comprises a repellent (1), an organosilicon compound (2) represented by the general formula (I):

(I)



wherein R^{1n} represents a saturated alkyl group containing 1 to 18 carbon atoms and, when nn is 2 or more, the R^{1n} groups may be the same or different; R^{2n} represents a saturated alkyl group containing 1 to 5 carbon atoms and, when nn is 2 or more, the R^{2n} groups may be the same or different; and nn represents an integer of 1 to 20, and a fluorine-containing resin (3).

US 6,410,627 B1

USE OF HIGH HYDROXYL COMPOUNDS FOR WATER SENSITIVE HOT MELT ADHESIVES

Charles W. Paul, Madison, and Mitchell J. Blumenthal, Belle Mead, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, New Castle, Del.

Filed Apr. 9, 1999, Appl. No. 289,025

This patent is subject to a terminal disclaimer.

Int. Cl. C08L *91/06;* **C08F** *20/00*

U.S. Cl. 524—277 **15 Claims**

1. A water ssensitive hot melt adhesive composition comprising a polymeric component and an amount of a solid hydroxyl polymer effective to improve the dispersibility of the hot melt adhesive in water, wherein said polymeric component comprises a sulfonated polyester or a graft copolymer of at least one vinyl monomer and at least one polyalkylene oxide polymer and wherein said solid hydroxyl polymer has an hydroxyl number greater then 100 mg KOH/g, and is present in the adhesive in an amount greater than 10% by weight.

US 6,410,628 B1

PHOTOACTIVATABLE NITROGEN-CONTAINING BASES BASED ON ALPHA-AMINO KETONES

Véronique Hall-Goulle, Bern, Switzerland, and Sean Colm Turner, Berkeley, Calif., assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Division of application No. 09/007,681, filed on Jan. 15, 1998. This application Jun. 13, 2001, Appl. No. 880,212.

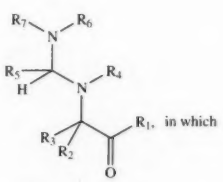
Claims priority, application Switzerland, Jan. 22, 1997, 133/97

Int. Cl. C08L *91/06;* **C07D** *239/70*

U.S. Cl. 524—279 **12 Claims**

1. A process for preparing a photolatent base compound of the formula II,

(II)



in which

R_1 is an aromatic or heteroaromatic radical which is capable of absorbing light in the wavelength range from 200 to 650 nm and in doing so brings about cleavage of the adjacent carbon-nitrogen bond;

R_2 and R_3 independently of one another are hydrogen, C_1–C_{18}alkyl, C_3–C_{18}alkenyl, C_3–C_{18}alkynyl or phenyl and, if R_2 is hydrogen or C_1–C_{18}alkyl, R_3 is additionally a group —CO—R_{14} in which R_{14} is C_1–C_{18}alkyl or phenyl;

or R_1 and R_3, together with the carbonyl group and the C atom to which R_3 is attached, form a benzocyclopentanone radical;

R_5 is C_1–C_{18}alkyl or $NR_{15}R_{16}$;

R_{15} and R_{16} independently of one another are hydrogen or C_1–C_{18}alkyl;

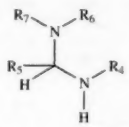
R_4 and R_6 together form a C_2–C_{12}alkylene bridge;

R_5 and R_7 together, independently of R_4 and R_6, form a C_2–C_{12}alkylene bridge or, if R_5 is $NR_{15}R_{16}$,

R_{16} and R_7 together form a C_2–C_{12}alkylene bridge;

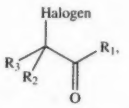
which comprises reacting a compound of the formula V

(V)



with a compound of the formula VI

(VI)



in which R_1, R_2, R_3, R_4, R_5, R_6 and R_7 are as defined above and Halogen is F, Cl, Br or I.

US 6,410,629 B1

INCORPORATION OF FREE RADICAL INHIBITORS IN POLYOLEFINS

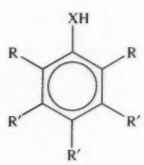
Michael J. Mullins, Lake Jackson, Tex.; Peter N. Nickias, and Jorge Soto, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Provisional application No. 60/025,430, filed on Sep. 4, 1996. This application Aug. 27, 1997, Appl. No. 920,625.

Int. Cl. C08K *5/51*

U.S. Cl. 524—351 **25 Claims**

1. A process for inhibiting deterioration in a polymer comprising admixing an inhibitor of Formula 1:



wherein XH is an active hydrogen group; each R is independently an aryl or alkyl hindering group having sufficient atoms to form a sterically hindered XH group, sufficiently hindered to avoid reaction of XH with a transition metal catalyst; and each R' is independently hydrogen or any inert substitution; with at least one olefin monomer, during or before polymerization thereof using a metallocene catalyst having a Group 3, Group 4, or Lanthanide transition metal wherein the mole ratio of inhibitor to any aluminum compounds present is at least about 100:1.

US 6,410,630 B1

HIGH SOLIDS FLUOROELASTOMER COMPOSITIONS

Gary Scott Hoover, Mount Laurel, N.J., and Edwin William Ross, Jr., Gladwyne, Pa., assignors to Pelseal Technologies, LLC, Newton, Pa.

Filed Dec. 29, 1999, Appl. No. 474,314

Int. Cl. C08K *5/07;3/10*

U.S. Cl. 524—365 **36 Claims**

1. A composition comprising:

a fluoroelastmeter having a Mooney Viscosity (ML 1+10@250° F.) about 60, selected from the group consisting of copolymers of hexafluoropropylene and vinylidene fluoride and terpolymers of hexafluoropropylene, vinylidene fluoride, and tetrafluoroethylene, and containing at least 40%, by weight, vinylidene fluoride;

up to 25%, by weight, solvent in which the fluoroelastomer is soluble, said solvent being present in an effective amount to make said composition workable;

and an LSA filler in the amount of 50 to 250 parts LSA filler per 100 parts of fluoroelastomer, wherein the solids content of the composition is at least about 75%.

US 6,410,631 B1

COMPOSITION FOR PRODUCTION OF SILICA GLASS USING SOL-GEL PROCESS

Jeong-Hyun Oh, Kumi-shi, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 27, 2000, Appl. No. 492,536

Claims priority, application Rep. of Korea, Jan. 29, 1999, 99-2900

Int. Cl. C08K *7/14;* **C08L** *57/12*

U.S. Cl. 524—386 **23 Claims**

1. A composition for production of silica glass using a sol-gel process, comprising:

a premix solution comprising a solvent, a monomer selected from the group consisting essentially of n-methylolacrylamide and n-methylolmethacrylamide, and a cross-linking agent;

a dispersing agent; and

silica particles,

wherein the weight content of said cross-linking agent relative to the weight of said premix solution is in the range of approximately 0.05 to 1% by weight and the ratio of the weight of said silica particles to the weight of said premix solution is in the range of approximately 6:4 to 4:6.

US 6,410,632 B1

METHOD FOR SUSPENDING BORATE PARTICLES IN AQUEOUS DISPERSIONS

Michael Howard West, 54 S. Crockett Rd., Senatobia, Miss. 38668

Filed Mar. 15, 1999, Appl. No. 268,123

Int. Cl. C08K *3/38*

U.S. Cl. 524—405 **1 Claim**

1. A method for suspending borate particles in aqueous dispersions which comprises blending in water, based on total composition, by weight, 20 to 60 parts of sodium tetraborate decahydrate with from 2 to 20 parts of an acrylic emulsion and adjusting the pH between 7 and 12 with an alkaline reagent comprising ethanolamine.

US 6,410,633 B1

ANTIBACTERIAL GLASS AND RESIN COMPOSITE COMPRISING THE SAME

Hajime Hikata; Kazuyoshi Shindo, and Toshio Yamanaka, all of Otsu, Japan, assignors to Nippon Electric Glass Co., Ltd., Otsu, Japan

Filed Feb. 3, 2000, Appl. No. 497,451

Int. Cl. C08K *3/38*

U.S. Cl. 524—405 **12 Claims**

1. An antibacterial ZnO—B_2O_3—SiO_2 glass which includes 0–6 wt % Na_2O and comprises 55–65 wt % ZnO.

US 6,410,634 B2

LOW GLOSS POLISH FORMULATIONS

Isaac B. Rufus, Newark, Del., and Hao A. Chen, Chadds Ford, Pa., assignors to Mannington Mills, Inc., Salem, N.J.

Filed Dec. 23, 1998, Appl. No. 219,863

Int. Cl. C08K *3/18*

U.S. Cl. 524—430 **32 Claims**

1. A low gloss surface covering polish formulation comprising:

at least one metal cross-linked polymeric film former;

at least one non-abrasive flatting agent; and

at least one liquid vehicle solvent, wherein the non-abrasive solid flatting agent comprises a non-abrasive silica, a non-abrasive aluminum oxide, or mixtures thereof.

US 6,410,635 B1

CURABLE COATING COMPOSITIONS CONTAINING HIGH ASPECT RATIO CLAYS

Alan J. Kaylo, Glenshaw; Richard F. Karabin, Ruffs Dale, both of Pa.; Tie Lan, Lake Zurich, Ill., and Michael G. Sandala, Pittsburgh, Pa., assignors to PPG Industries Ohio, Inc., Cleveland, Ohio

Filed Feb. 22, 1999, Appl. No. 255,207

Int. Cl. C08K *3/34;* **C08G** *59/42;59/50*

U.S. Cl. 524—447 **24 Claims**

1. A curable coating composition comprising the following components:

(a) a polymer containing reactive functional groups;

(b) a curing agent containing functional groups which are reactive with the functional groups of (a); and

(c) an acidified dispersion of exfoliated silicate prepared by

(1) contacting a layer silicate having interlayer cations with an acid or acid solution to exchange the interlayer cations;

(2) intercalating the acidified layer silicate of (1) with an exfoliating polymer; and

(3) exfoliating the intercalated layer silicate of (2) by applying shear to the intercalated silicate/acid mixture, wherein said exfoliating polymer is compatible with the polymer (a) and the curing agent (b).

US 6,410,636 B2

WATER DISPERSED PRIMERS

James David Groves, Hudson, Wis., assignor to 3M Innovative Properties Company, St. Paul, Minn.

Continuation of application No. 09/558,464, filed on Apr. 25, 2000, now Pat. No. 6,303,685. This application Aug. 9, 2001, Appl. No. 925,951.

Int. Cl. C08K *3/36;* **C08L** *27/04*

U.S. Cl. 524—493 **4 Claims**

1. A water dispersed primer composition consisting of:

a solution of a chlorinated hydrocarbon polymer in organic solvent; and

a particulate dispersing agent added to said solution to form a fluid primer to be dispersed in water to provide said water dispersed primer composition, said organic solvent selected from the group consisting of cyclohexane, heptane, hexane, xylene, toluene, chlorotoluene, mixed hydrocarbon solvents, and mixtures thereof.

US 6,410,637 B1

WATER-BASED COMPOSITION FOR COATING A DONOR MEMBER

Peter G. Odell, Mississauga, Canada; Richard D. Hunt, Rochester; Thomas Thomson, Fairport, both of N.Y.; Yvonne J. M. Groot, Horst, Netherlands; Jas Paul S. Dhillon, Pittsford, and Michael F. Zona, Holley, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 2000, Appl. No. 722,347

Int. Cl. C08K *3/04;* **C08L** *61/06;29/04;* **B32B** *27/42*

U.S. Cl. 524—495 **25 Claims**

1. A waterborne coating composition comprising

a resin binder comprising a phenolic resin, a conductive particle material, an additional particle material selected from the group consisting of (1) graphite particles with a dispersant of polyacrylamide, polyethylene oxide, polyvinyl alcohol or mixtures thereof and (2) crosslinked polymer particles, and water.

US 6,410,638 B1

ALIPHATIC, SINTERABLE, THERMOPLASTIC POLYURETHANE MOLDING COMPOSITIONS

Wolfgang Kaufhold, Köln; Hans-Georg Hoppe, Leichlingen; Rainer Ohlinger, Hannover, and Jürgen Bühring, Burgwedel, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, and Benecke-Kaliko Aktiengesellschaft, Hannover, both of Germany

Filed Apr. 26, 2000, Appl. No. 558,910

Claims priority, application Germany, May 4, 1999, 199 20 367

Int. Cl. C08J *83/00*

U.S. Cl. 524—507 **16 Claims**

1. A thermoplastic molding composition in the form of sinterable powder consisting of:

(i) a resinous blend of (a) thermoplastic polyurethane the diisocyanate reactant used in its preparation is one of aliphatic and cycloaliphatic, and (b) at least one member selected from the group consisting of

acrylonitrile-styrene-polyacrylate rubber,

copolymer of ethylene and acrylic acid,

copolymer of ethylene and methacrylic acid,

copolymer of ethylene and sodium salt of acrylic acid,

copolymer of ethylene and sodium salt of methacrylic acid,

copolymer of ethylene and zinc salt of acrylic acid,

copolymer of ethylene and zinc salt of methacrylic acid,

copolymer of ethylene and ester of acrylic acid,

copolymer of ethylene and ester of methacrylic acid,

copolymer of propylene and acrylic acid,

copolymer of propylene and methacrylic acid,

copolymer of propylene and sodium salt of acrylic acid,

copolymer of propylene and sodium salt of methacrylic acid,

copolymer of propylene and zinc salt of acrylic acid,

copolymer of propylene and zinc salt of methacrylic acid,

copolymer of propylene and ester of acrylic acid,

copolymer of propylene and ester of methacrylic acid,

copolymer of ethylene, propylene and acrylic acid,

copolymer of ethylene, propylene and methacrylic acid,

copolymer of ethylene, propylene and sodium salt of acrylic acid,

copolymer of ethylene, propylene and sodium salt of methacrylic acid,

copolymer of ethylene, propylene and zinc salt of acrylic acid,

copolymer of ethylene, propylene and zinc salt of methacrylic acid,

copolymer of ethylene, propylene and ester of acrylic acid, and

copolymer of ethylene, propylene and ester of methacrylic acid;

(ii) a UV stabilizer; and

(iii) an antioxidant.

US 6,410,639 B1

FILMING SOLUTION AND METHOD FOR FORMING A FILMING LAYER ON A CATHODE RAY TUBE

Young-Jong Kang; Ik-Chul Lim; Seung-Joon Yoo, all of Kyonggi-do, and Eun-Ha Hoh, Seoul, all of Rep. of Korea, assignors to Samsung SDI Co., Ltd., Youngin, Rep. of Korea

Filed Jan. 5, 2000, Appl. No. 478,042

Claims priority, application Rep. of Korea, Jun. 11, 1999, 99-21706

Int. Cl. C08L *33/06*

U.S. Cl. 524—561 **14 Claims**

1. A filming solution, comprising:

a copolymerized emulsion having more than 70 weight percent of butyl methacrylate, having more than one species of monomer, and having sodium dodecyl sulfosuccinate; and

more than one species of additive;

said more than one species of monomer being selected from the group consisting of acrylic acid derivative, methacrylic acid derivative, styrene, acrylamide, and acrylonitrile;

said methacrylic acid derivative being selected from the group consisting of methacrylic acid, methyl methacrylate, ethyl methacrylate, hydroxyethyl methacrylate, isobonyl methacrylate, benzyl methacrylate, and phenoxy methacrylate.

US 6,410,640 B1

ONE-PACK TYPE CURABLE RESIN COMPOSITION

Atsushi Fukunaga; Yoshiteru Masaoka; Hiroshi Ando, and Fumio Kawakubo, all of Hyogo, Japan, assignors to Kaneka Corporation, Osaka, Japan

Filed Mar. 29, 2000, Appl. No. 536,990

Claims priority, application Japan, Mar. 29, 1999, 11-086689

Int. Cl. C08L *83/04;83/06;* **C08G** *77/08*

U.S. Cl. 524—588 **6 Claims**

1. A one-pack type curable resin composition which contains an organic polymer (a) having at least one reactive silicon group per molecule, a silane coupling agent (b) having reactive silicon group in its molecule, a non-phthalate plasticizer (c) having no phthalate structure in its molecule, and a stannous curing catalyst (d).

US 6,410,641 B2

CURED RUBBER AND METHOD OF TREATING CURED RUBBER

Shinichi Sato, and Masatoshi Arai, both of Usui-gun, Japan, assignors to Shin-Etsu Chemical Co., Ltd, Tokyo, Japan

Filed Feb. 7, 2001, Appl. No. 777,904

Claims priority, application Japan, Feb. 8, 2000, 2000-030720

Int. Cl. C08L *83/08*

U.S. Cl. 524—588 **3 Claims**

1. A cured rubber made of a curable rubber composition comprising a curable organopolysiloxane, a curing agent therefor, and a silica filler having a mean particle size of 0.001 to 10 μm, the cured rubber being post treated with a hydrolyzable aminosilane or amidosilane having a Si—N bond.

US 6,410,642 B1

ADHESIVE AND SEMICONDUCTOR DEVICES

Kimio Yamakawa; Minoru Isshiki, and Katsutoshi Mine, all of Chiba, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Jun. 20, 2000, Appl. No. 597,061

Claims priority, application Japan, Jul. 8, 1999, 11-193828

Int. Cl. C08K *3/00*

U.S. Cl. 524—847 **9 Claims**

1. An adhesive composition for bonding a semiconductor chip to an attachment member for the chip comprising a curable polymer composition comprising a spherical filler having an average particle size from greater than 100 to 1,000 μm and a major axis-to-minor axis ratio from 1 to 1.5, and where the standard deviation for the particle size distribution of the spherical filler does not exceed 10% of the average particle size of the spherical filler.

US 6,410,643 B1

SOLID PHASE SYNTHESIS METHOD AND REAGENT

Melvin J. Swanson, Carver, Minn., assignor to SurModics, Inc., Eden Prairie, Minn.

Filed Mar. 9, 2000, Appl. No. 521,552

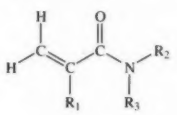
Int. Cl. C08H *21/00;21/02;21/04*

U.S. Cl. 525—54.11 **23 Claims**

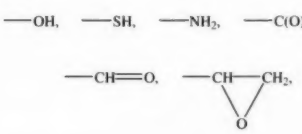
1. A method for performing solid phase synthesis, the method comprising the steps of:

a) providing a support material providing a surface adapted for use in combinatorial synthesis,

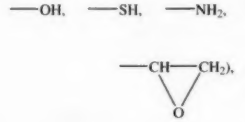
b) providing a polymeric reagent formed by the polymerization of monomers of the formula:



wherein R_1 represents hydrogen or C_1–C_6 alkyls, and wherein R_2 and R_3, independently among them, represent hydrogen, C_1–C_6 alkyls or phenyls containing one or more reactive substituents selected from



OR_5, or SR_5 (where R_4 is a C_1–C_6 alkyl or a heterocyclic ring containing one or more nitrogen atoms and R_5 is a C_1–C_6 alkyl or phenyl containing one or more reactive substituents selected from



c) applying the reagent to the support surface and covalently attaching the polymeric reagent to the support surface,

d) providing a first reactive monomer selected from nucleotides and amino acids, the monomer comprising a corresponding group thermochemically reactive with the bound reactive substituent,

e) contacting and reacting the first monomer with the polymeric reagent upon the support surface under conditions suitable to react the corresponding group with the bound reactive substituent, thus providing a growing polymeric chain, and

f) providing and sequentially attaching subsequent monomers to the growing polymeric chain to obtain a desired polymeric product.

US 6,410,644 B2

TEMPERATURE SENSITIVE POLYMERS AND WATER-DISPERSIBLE PRODUCTS CONTAINING THE POLYMERS

Pavneet Singh Mumick; Yihua Chang, and James Hongxue Wang, all of Appleton, Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Division of application No. 09/386,615, filed on Aug. 31, 1999, now Pat. No. 6,277,768, which is a division of application No. 08/778,724, filed on Dec. 31, 1996, now Pat. No. 5,969,052. This application May 18, 2001, Appl. No. 861,355.

Int. Cl. C08F *8/32;* **C08L** *31/64*

U.S. Cl. 525—60 **9 Claims**

1. A polymer containing N-isopropyl acrylamide structural units, said polymer produced by a continuous extrusion method, said method comprising:

forming an intermediate salt from a reaction mixture comprising polyacrylic acid and isopropylamine; and

conducting a condensation reaction to convert the salt to the polymer and water.

US 6,410,645 B1

MULTIBLOCK BIODEGRADABLE HYDROGELS FOR DRUG DELIVERY AND TISSUE TREATMENT

Chandrashekhar P. Pathak, Lexington; Shikha P. Barman, Bedford; C. Michael Philbrook, Boston; Amarpreet S. Sawhney, Lexington; Arthur J. Coury, Boston; Luis Z. Avila, Arlington, all of Mass., and Mark T. Kieras, Burlingame, Calif., assignors to Focal, Inc., Lexington, Mass.

Division of application No. 08/692,914, filed on Jul. 26, 1996, now Pat. No. 6,201,065, Provisional application No. 60/001,723, filed on Jul. 28, 1995. This application Nov. 9, 2000, Appl. No. 710,416.

Int. Cl. A61K *31/765;9/107;* **C08L** *53/00*

U.S. Cl. 525—78.02 **9 Claims**

1. A method of treating a medical condition, comprising applying to tissue in vivo an aqueous solution of a gel-forming macromer, comprising at least four covalently-linked polymeric blocks, wherein

a) at least one block is hydrophilic;

b) each hydrophilic block individually has a water solubility of at least 1 gram/liter; and

c) at least two blocks are sufficiently hydrophobic to aggregate to form micelles in an aqueous continuous phase; and

wherein the macromer further comprises at least one crosslinkable group and the macromer comprises at least one thermally sensitive region.

US 6,410,646 B1

METHOD FOR PRODUCING SCRATCH RESISTANT COATINGS, ESPECIALLY FOR PRODUCING MULTI-LAYER ENAMELS

Ulrike Röckrath, Senden; Peter Betz, Münster; Fritz Bartol, Hamm; Georg Wigger, and Hubert Baumgart, both of Münster, all of Germany, assignors to BASF Coatings AG, Muenster-Hiltrup, Germany

PCT No. PCT/EP93/01265, § 371 Date Nov. 8, 1999, § 102(e) Date Nov. 8, 1999, PCT Pub. No. WO98/40442, PCT Pub. Date Sep. 17, 1998

PCT Filed Mar. 6, 1998, Appl. No. 380,524

Claims priority, application Germany, Mar. 7, 1997, 197 09 465

Int. Cl. C08F *8/90*

U.S. Cl. 525—124 **19 Claims**

1. A coating composition that has, after curing, a storage modulus E' in a rubber-elastic range of at least $10^{7.5}$ Pa and a loss factor tanδ at 20° C. of at least 0.05, the storage modulus E' and the loss factor tanδ having been measured by dynamic mechanical thermoanalysis on homogeneous free films having a film thickness of 40±10 μm; and said coating composition comprises:

at least one binder comprising at least one polyacrylate resin having a hydroxyl number of from greater than 200 to 240, an acid number of from 0 to 35 and a number-average molecular weight of from 1500 to 10,000;

a crosslinker consisting of a compound selected from the group consisting of free isocyanates, blocked isocyanates, triazine-based components, and mixtures thereof wherein the triazine-based component crosslinks with hydroxyl groups of the binder to form at least one of an ether and an ester structure; and

wherein when a triazine-based component is present in the coating composition, the polyacrylate resin further comprises in its reaction product at least one ethylenically unsaturated carboxylic acid.

US 6,410,647 B1

COMPOSITION OF ACRYLIC POLYCARBOXYLIC ACID, POLYESTER POLYCARBOXYLIC ACID AND POLYEPOXIDE

Manabu Yoshioka, Shijonawate; Akira Fushimi, Ikoma; Seigo Miyazoe, Ibaraki; Masanobu Inoue, Nishinomiya, and Yoshio Eguchi, Ikeda, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Division of application No. 08/875,175, filed as application No. PCT/JP96/00079, filed on Jan. 19, 1996, now abandoned. This application Nov. 30, 1999, Appl. No. 450,719.

Claims priority, application Japan, Jan. 24, 1995, 7-9100

Int. Cl. C08L *33/02;33/14;63/00;67/00;67/04*

U.S. Cl. 525—166 **8 Claims**

1. A clear coating composition comprising, as a binder component, a curable resin composition comprising:

(a) 10 to 70% by weight of an acrylic polycarboxylic acid having 2 or more carboxyl groups per molecule on an average, an acid value of 5 to 300 mg KOH/g (solid) and a number-average molecular weight of 500 to 8000 obtained by copolymerizing an acid anhydride group-containing ethylenically unsaturated monomer with an ethylenically unsaturated mononer having no acid anhydride group and then reacting the resulting copolymer with a monoalcohol;

(b) 5 to 70% by weight of a polyester polycarboxylic acid having an acid value of 50 to 350 mg KOH/g (solid), a number-average molecular weight of 400 to 3500 and a ratio of weight-average molecular weight to number-average molecular weight of 1.8 or less, which is obtained by reacting a polyester polyol having 3 or more hydroxyl groups with an acid anhydride group-containing compound; and

(c) 10 to 80% by weight of a polyepoxide with both an epoxy group and a hydroxyl group, having an epoxy equivalent of 50 to 700 and a number-average molecular weight of 200 to 10000;

provided that the amounts of the components (a) to (c) are based on the weight of the total solid contained in the curable resin composition; and

further comprising (d) crosslinked resin particles prepared in the presence of an amphoteric ionic group-containing polyester resin.

US 6,410,648 B1

TACKY FILMS

Yoshihiko Sasaki, and Kazutoshi Takenaka, both of Mie, Japan, assignors to Japan Polychem Corporation, Tokyo, Japan

PCT No. PCT/JP98/05704, § 371 Date Aug. 24, 2000, § 102(e) Date Aug. 24, 2000, PCT Pub. No. WO99/31169, PCT Pub. Date Jun. 24, 1999

PCT Filed Dec. 17, 1998, Appl. No. 581,817

Claims priority, application Japan, Dec. 17, 1997, 9-364085

Int. Cl. C08L *23/00;23/04*

U.S. Cl. 525—191 **10 Claims**

1. A tacky film characterized by comprising a polyethylene resin composition which is a composition obtained by blending ingredient A shown below with ingredient B shown below and which has an ingredient B content of 80% by weight or lower and a density of from 0.884 to 0.910 g/cm^3,

ingredient A: a linear low-density polyethylene having the following properties (1) and (2);

(1) to have an MFR of from 0.1 to 10 g/10 min,

(2) to have a density of from 0.890 to 0.940 g/cm^3,

ingredient B: a linear low-density polyethylene having the following properties (3) and (4);

(3) to have an MFR of from 0.1 to 50 g/10 min,

(4) to give, in differential scanning calorimetry (DSC), a melting peak whose extrapolated melting termination temperature is 98° C. or lower.

US 6,410,649 B1

RESIN COMPOSITION

Takeshi Oda; Shigeru Suzuki; Toru Arai; Akio Okamoto; Masataka Nakajima, all of Machida, and Hideki Toya, Ichihara, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP99/01412, § 371 Date Sep. 22, 2000, § 102(e) Date Sep. 22, 2000, PCT Pub. No. WO99/48972, PCT Pub. Date Sep. 30, 1999

PCT Filed Mar. 19, 1999, Appl. No. 646,771

Claims priority, application Japan, Mar. 23, 1998, 10-072940; Mar. 23, 1998, 10-072941; Mar. 23, 1998, 10-072942; Mar. 23, 1998, 10-074397; Oct. 15, 1998, 10-293352; Oct. 15, 1998, 10-293353

Int. Cl. C08L *23/00;23/36;25/00;25/18;25/02*

U.S. Cl. 525—191 **17 Claims**

1. A resin composition comprising from 5 to 95 wt % of an aromatic vinyl compound/olefin random copolymer (A) which has an aromatic vinyl compound content of from 1 to 99 mol % and has a head-to-tail chain structure composed of two or more aromatic vinyl compound units, and from 95 to 5 wt % of at least one of an α-olefin polymer or copolymer (B) and an aromatic vinyl compound polymer or copolymer (C), wherein (B) and (C) are each different from (A).

US 6,410,650 B1

ETHYLENE/α-OLEFIN/UNCONJUGATED POLYENE COPOLYMER RUBBER, RUBBER COMPOSITION FOR SEALING, MOLDED RUBBER FOR SEALING, AND PROCESS FOR PRODUCING THE MOLDED RUBBER

Taku Koda, and Masaaki Kawasaki, both of Chiba, Japan, assignors to Mitsui Chemicals INC, Tokyo, Japan

PCT No. PCT/JP00/01967, § 371 Date Nov. 28, 2000, § 102(e) Date Nov. 28, 2000, PCT Pub. No. WO00/59962, PCT Pub. Date Oct. 12, 2000

PCT Filed Mar. 29, 2000, Appl. No. 701,304

Claims priority, application Japan, Apr. 2, 1999, 11-96475

Int. Cl. C08F *210/18;8/34;* **C08L** *23/08;23/16;* **C09K** *3/10*

U.S. Cl. 525—191 **9 Claims**

1. An ethylene-α-olefin-non-conjugated polyene copolymer rubber comprising ethylene, an α-olefin having 3 to 20 carbon atoms and a non-conjugated polyene, characterized in that:

(i) the intrinsic viscosity [η] as measured in decalin solvent at 135° C. is 1.5 to 5.0 dl/g;

(ii) the gη$^+$ or g' value is 0.6 to 0.9, wherein the gη$^+$ value is defined as a ratio of the intrinsic viscosity [η] as measured in (i) above to an intrinsic viscosity $[\eta]_{blank}$ as measured in decalin solvent at 135° C. of a linear ethylene-propylene copolymer having an ethylene content of 70% by mole which has the same weight average molecular weight (according to light scattering method) as the ethylene-α-olefin-non-conjugated polyene copolymer rubber having the intrinsic viscosity [η] ($[\eta]/[\eta]_{blank}$), and the g' value is defined as a ratio of the intrinsic viscosity [η] as measured in (i) above to an intrinsic viscosity $[\eta]_{blank}$' as reduced to a linear ethylene-propylene copolymer having an ethylene content of 70% by mole, which is determined by gel permeation chromatography (140° C., o-dichlorobenzene solvent) of the ethylene-α-olefin-non-conjugated polyene copolymer ($g'=[\eta]/[\eta]_{blank}'$);

(iii) the Mw/Mn is 3.0 to 50;

(iv) the iodine value is 10 to 40;

(v) the molar ratio of ethylene to the α-olefin having 3 to 20 carbon atoms is 40/60 to 95/5; and

(vi) the intensity ratio D of Tαβ to Tαα in ^{13}C-NMR spectrum (Tαβ/Tαα) is 0.5 or less.

US 6,410,651 B1

CABLES WITH A HALOGEN-FREE RECYCLABLE COATING COMPRISING POLYPROPYLENE AND AN ETHYLENE COPOLYMER HAVING HIGH STRUCTURAL UNIFORMITY

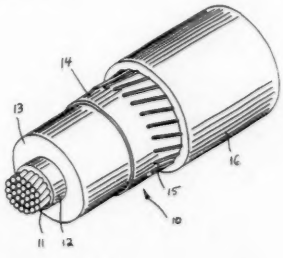
Luca Castellani, Corsico, Italy; Eduardo Grizante Redondo, Sao Paulo, Brazil; Antonio Zaopo, Milan, and Enrico Albizzati, Lesa, both of Italy, assignors to Pirelli Cavi e Sistemi S.p.A., Milan, Italy

Continuation-in-part of application No. 09/121,558, filed on Jul. 23, 1998, now Pat. No. 6,255,399. This application Jan. 21, 2000, Appl. No. 488,829.

Claims priority, application Italy, Jul. 23, 1997, MI97A1739

Int. Cl. H01B *3/00;7/00*

U.S. Cl. 525—232 **33 Claims**



1. A cable, comprising:

a conductor; and

a coating layer comprising a flame-retardant polymer composition;

wherein the flame-retardant polymer composition comprises:

a crystalline propylene homopolymer or copolymer;

a copolymer of ethylene with at least one alpha-olefin having from 4 to 12 carbon atoms, the copolymer of ethylene having a density of from 0.86 g/cm^3 to 0.90 g/cm^3 and by a Composition Distribution Index, defined as a weight percentage of copolymer molecules having an alpha-olefin content within 50% of an average total molar content of alpha-olefin, of at least 45%;

a flame-retardant inorganic filler.

US 6,410,652 B1

PROCESSES FOR PREPARING GRAFTED COPOLYMERS

Irwin L. Goldblatt, Edison, and Richard P Sauer, North Plainfield, both of N.J., assignors to Castrol Limited, Swindon, United Kingdom

Provisional application No. 60/063,689, filed on Oct. 28, 1997. This application Apr. 6, 2000, Appl. No. 529,013.

Int. Cl. C08F *267/04;271/02*

U.S. Cl. 525—279 **60 Claims**

1. A method of making a graft copolymer, comprising the steps of:

(a) introducing an ethylene/propylene (EP) copolymer or other graftable polymer into a screw extruder;

(b) introducing into said extruder separately from said copolymer or other graftable polymer an ethylenically unsaturated monomer which is at least one selected from the group consisting of monomers containing one or more of the following: sulfur, nitrogen and oxygen, into the extruder as a mixture with a polar solvent such that the concentration of monomer in the mixture is 5–95% w/w;

(c) introducing into the extruder an amount of an initiator sufficient to graft said monomer and EP copolymer or other graftable polymer; and

(d) reacting said EP copolymer or other graftable polymer, said ethylenically unsaturated monomer and said initiator by operating said extruder, thereby forming the graft copolymer.

US 6,410,653 B1

HIGHLY SATURATED CARBOXYLATED NITRILE COPOLYMER RUBBER AND PROCESS FOR THE PRODUCTION THEREOF

Yoshinori Fujii, and Atsumi Ikeda, both of Kawasaki, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

PCT No. PCT/JP97/03294, § 371 Date Mar. 25, 1999, § 102(e) Date Mar. 25, 1999, PCT Pub. No. WO98/13390, PCT Pub. Date Apr. 2, 1998

PCT Filed Sep. 18, 1997, Appl. No. 269,289

Claims priority, application Japan, Sep. 27, 1996, 8-277015; Mar. 28, 1997, 9-094874

Int. Cl. C08C *19/36;* **C08L** *13/00;9/02*

U.S. Cl. 525—285 **7 Claims**

1. A carboxylated ethylenically unsaturated nitrile-conjugated diene copolymer rubber having the following physical properties:

(a) the acid equivalent being at least 1×10^{-4} equivalents per hundred gram (ephr),

(b) the ratio of [peak height of a carboxylic acid anhydride group]/([peak height of the carboxylic acid anhydride group]+[peak height of a carboxyl group]) in its infrared absorption analysis being at least 0.5,

(c) the Mooney viscosity being 15 to 200,

(d) the iodine value being at most 80 grams per 100 grams, and

(e) the content of methyl ethyl ketone-insoluble matter in the rubber being 5 wt. % or lower.

US 6,410,654 B1

HIGHLY RIGID, HIGH-TENACITY IMPACT-RESISTANT POLYSTYRENE

Philippe Desbois, Maikammer; Christian Schade, Ludwigshafen; Hermann Gausepohl, Mutterstadt, and Volker Warzelhan, Weisenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP99/04343, § 371 Date Dec. 18, 2000, § 102(e) Date Dec. 18, 2000, PCT Pub. No. WO99/67308, PCT Pub. Date Dec. 29, 1999

PCT Filed Jun. 23, 1999, Appl. No. 719,818

Claims priority, application Germany, Jun. 24, 1998, 198 28 104

Int. Cl. C08F *4/46;4/52;279/04*

U.S. Cl. 525—316 **13 Claims**

1. An impact-modified polystyrene which has been obtained by polymerization of styrene in the presence of an asymmetric anionically polymerized styrene-butadiene-styrene three-block copolymer with a styrene content of from 5 to 75% by weight, wherein a polymerization of said three-block copolymer is carried out in the presence of an organic alkali metal compound, and wherein a polymerization of styrene is carried out in the presence of a trialkylaluminum compound and/or dialkylmagnesium compound.

US 6,410,655 B2

RESIN COMPOSITION FOR AQUEOUS PAINT

Masayoshi Okubo, Hyogo; Shinya Sakaguchi, Wakayama; Atsushi Takamatsu, Tochigi; Hiroharu Sasaki, Tochigi, and Kazuyoshi Tsuneta, Tochigi, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed Dec. 8, 2000, Appl. No. 731,721

Claims priority, application Japan, Dec. 9, 1999, 11-349808

Int. Cl. C08F *265/02;220/26;8/14*

U.S. Cl. 525—330.1 **16 Claims**

1. A resin composition for an aqueous paint, comprising:

different phase structure emulsion particles obtained by multistage emulsion polymerization as a binder;

wherein the different phase structure emulsion particles have an outermost phase formed by an emulsion polymer of an ethylenic unsaturated monomer, said emulsion polymer having a glass transition temperature of from −50° C. to 10° C., and

wherein said resin composition satisfies the following conditions (1) to (3):

(1) the emulsion polymer forming the outermost phase of the different phase structure emulsion particles contains from 1 to 20 mass % of an ethylenic unsaturated monomer having at least one a unit selected from the group consisting of a polyethylene glycol chain, a polypropylene glycol chain and a mixture thereof;

(2) at least one phase of inner phases from the outermost phase of the different phase structure emulsion particles comprises an emulsion polymer of an ethylenic unsaturated monomer, said emulsion polymer having a glass transition temperature of from 30° C. to 110° C., and

(3) the binder has a minimum film-forming temperature of at most 10° C.;

wherein the ethylenic unsaturated monomer having the polyethylene glycol chain or the polypropylene glycol chain is represented by formula (1),

$$CH_2{=}C(R^1){-}C(=O){-}O{-}[X{-}O]_n{-}R^2 \quad (1)$$

wherein

R^1 is H or CH_3,

R^2 is H or a C_1–C_8 alkyl group,

X is $-(CH_2)_2-$ or $-CH_2CH(CH_3)-$, and

n is an integer of from 1 to 30.

US 6,410,656 B1

CATION EXCHANGERS OR CHELATING AGENTS AND PROCESS FOR THE PREPARATION THEREOF

Hirohisa Kubota; Katsuhiko Yano; Junya Watanabe, all of Yokohama, and Akinori Jyo, Kumamoto, all of Japan, assignors to Mitsubishi Chemical Corporation, Japan

PCT No. PCT/JP97/02623, § 371 Date Apr. 29, 1999, § 102(e) Date Apr. 29, 1999, PCT Pub. No. WO98/04598, PCT Pub. Date Feb. 5, 1998

PCT Filed Jul. 29, 1997, Appl. No. 230,578

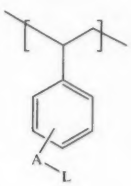
Claims priority, application Japan, Jul. 31, 1996, 8-219476; Jul. 31, 1996, 8-219477

Int. Cl. C08F *8/34*

U.S. Cl. 525—332.2 **5 Claims**

1. A cation exchanger or a chelating agent having at least structural units represented by the following formula (I) and structural units being derived from a crosslinkable monomer containing an unsaturated hydrocarbon group:

(I)



wherein A represents a C_4–C_9 alkoxymethylene group; L represents $SO_3^-X^+$, where X^+ is a counter ion coordinated with the SO_3^- group, or a chelate-forming functional group; and the benzene ring may be substituted with an alkyl group or a halogen atom.

US 6,410,657 B1

METHOD FOR THE SELECTIVE HYDROGENATION OF POLYMER CONTAINING CONJUGATED DIENE

Young Hoon Ko; Hoo Chae Kim; Jae Yun Kim, and Jin Man Hwang, all of Taejon, Rep. of Korea, assignors to Korea Kumho Petrochemical Co., LTD, Seoul, Rep. of Korea

Filed Aug. 15, 2000, Appl. No. 640,102

Claims priority, application Rep. of Korea, Nov. 26, 1999, 99-53045

Int. Cl. C08F *8/04*

U.S. Cl. 525—338 **17 Claims**

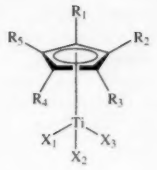
1. A method for the selective hydrogenation of polymer containing conjugated diene in hydrogenating the double bonds only in the conjugated dienes of polymer, which is selected from a homopolymer of conjugated diene monomer or a copolymer consisting of a conjugated diene monomer and aromatic vinyl monomer, wherein it comprises:

1) at least one conjugated diene is individually polymerized or copolymerized to create a living polymer using an organolithium compound as initiator;

2) the end of the living polymer, so formed, is treated using an equimolar amount of an end-modifying material; and,

3) a monocyclopentadienyl titanium compound expressed by the following formula 1 and lithium hydride (LiH), so prepared via the reaction between an organolithium compound and hydrogen are added to the polymer in solution whose end is modified but lithium hydride may be added individually or in a mixed form with catalyst by premixing

Formula 1



wherein, R_1, R_2, R_3, R_4 and R_5, which may be same or different, are selected from hydrogen atoms and alkyl groups of 1~5 carbon atoms; X_1, X_2 and X_3, which may be same or different, are selected from halogen atoms.

US 6,410,658 B1

POLYEPOXIDE/POLYETHER MONO- OR POLYAMINE PRECURSOR REACTED WITH MONO- OR POLYAMINE, EPOXY RESIN-AMINE ADDUCT AND MONOEPOXIDE-AMINE ADDUCT

Markus Schrötz, Oberhausen; Martin Fulgraff, Herne; Peter Martischewski; Jurgen Schillgalies, both of Moers, and Rolf Herzog, Bottrop, all of Germany, assignors to Bakelite AG, Germany

Filed May 9, 2001, Appl. No. 813,179

Claims priority, application Germany, Mar. 23, 2000, 100 13 735

Int. Cl. C08G *59/14;* **C08K** *3/20;* **C08L** *63/02*

U.S. Cl. 525—526 **7 Claims**

1. A curing agent for epoxy resins comprises:

a) a reaction product of at least one polyalkylene polyether monoamine and/or polyamine having a molecular weight of from 148 to 5000 with a polyepoxide and, optionally, a monoepoxide, in a ratio of amine hydrogen, optionally remaining after reaction with the monoepoxide, and epoxide groups of the polyepoxide of from 1:1.4 to 1:6 to obtain an epoxide group-containing precursor, the precursor further reacted with a primary monoamine and/or a primary or secondary polyamine in at least a 10% molar excess relative to the epoxide groups of the precursor, the reaction product being substantially free of non-reacted amines;

b) an amine-terminated adduct of an epoxy resin and a primary monoamine and/or a primary or secondary polyamine being substantially free of non-reacted amines; and

c) an amine-terminated adduct of an epoxide group-containing reactive thinning agent and a primary monoamine and/or a primary or secondary polyamine being substantially free of non-reacted amines.

US 6,410,659 B1

POLYMERIZATION PROCESS

Peter James Maddox, Kingston-Upon-Thames; John Paul McNally, Reading, and David Pratt, Egham, all of United Kingdom, assignors to BP Chemicals Limited, London, United Kingdom

Continuation of application No. 08/657,534, filed on Jun. 5, 1996, now abandoned, which is a continuation of application No. 08/410,984, filed on Mar. 27, 1995, now abandoned. This application Jul. 31, 1997, Appl. No. 904,236.

Claims priority, application United Kingdom, Apr. 7, 1994, 9406855; Aug. 26, 1994, 9417364

Int. Cl. C08F *4/64;4/642;4/646*

U.S. Cl. 526—114 **11 Claims**

1. A process for preparing bimodal molecular weight distribution copolymers of ethylene with alpha-olefins having from 3 to 20 carbon atoms, said copolymers having:

(a) a comonomer distribution wherein the comonomer level at the mid-position of the low molecular weight component is

less than or equal to 1.6 times the level at the mid-position of the high molecular weight component, and

(b) a total average comonomer content in the range from 0.5 to 20 short chain branches (SCB)/1000 carbon atoms

wherein said process is carried out in the presence of a supported multisite catalyst, wherein all the catalyst components are supported on a single support, said catalyst comprising a Ziegler catalyst component and a metallocene component having any of the formulae:

$$(C_5R_5)(C_5R^1{}_5)MY_2 \quad \text{(I)}$$

$$(C_5R_2H_3)(C_5R^1{}_2H_3)MY_2 \quad \text{(II)}$$

$$(C_5R_4)Z(C_5R^1{}_4)MY_2; \quad \text{(III)}$$

or

$$(C_5R_mH_{5-m})(C_5R^1{}_nR_{5-n})MY_2 \quad \text{(IV)}$$

wherein:

C_5R_5 and $C_5R^1{}_5$ represent a cyclopentadienyl ligand,

R and R^1 are alkyl, aryl, alkylaryl, alkenyl, or haloalkyl groups and may be the same or different,

Z is a bridging group selected from the group consisting of CX_2, SiX_2, and GeX_2,

X is hydrogen or a group as defined by R and R^1, M is Zr, Ti, or Hf,

Y is a univalent anionic ligand

and wherein in Formula (II) at least one of R and R^1 has ≧three carbon atoms, and in Formula (IV) m is 3 or 4 and n is 5 or less.

US 6,410,660 B1

POLYMERIZATION OF OLEFINS

Lynda Kaye Johnson, and Joel David Citron, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Provisional application No. 60/079,734, filed on Mar. 27, 1998. This application Mar. 22, 1999, Appl. No. 273,410.

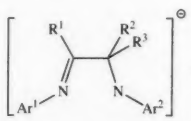
Int. Cl. C08F *4/642;4/70;4/80*

U.S. Cl. 526—115 **20 Claims**

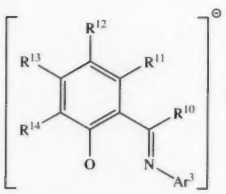
1. A process for the polymerization of olefins, comprising, contacting under polymerizing conditions:

(a) a first active polymerization catalyst for said olefins which contains a Ni complex of a ligand selected from the group consisting of:

(I)



(II)



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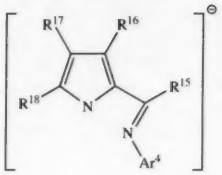
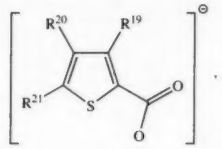
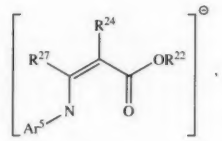
(III)



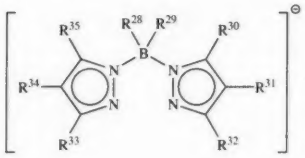
(IV)



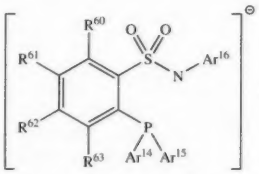
(V)



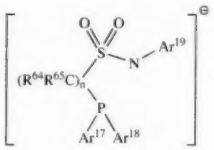
(VI)



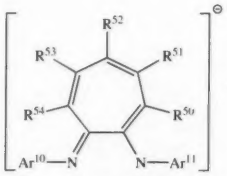
(VII)



(VIII)



(XVIII)



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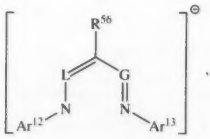

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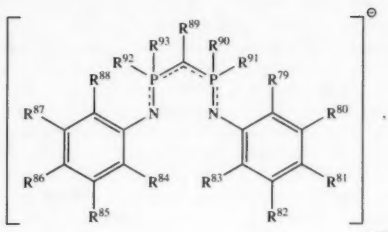
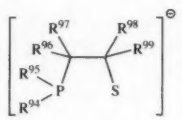


, or

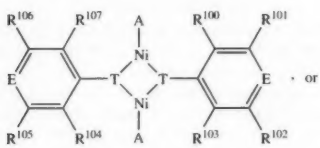
(XXXVIII)



,

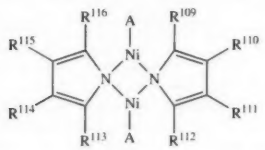
or a compound of the formula

(XXXIX)



, or

(XXXX)



wherein:

Ar^1, Ar^2, Ar^4, Ar^5, Ar^{10}, Ar^{11}, Ar^{12} and Ar^{13} are each independently aryl or substituted aryl;

R^1 and R^2 are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl, or R^1 and R^2 taken together form a ring, and R^3 is hydrogen, hydrocarbyl or substituted hydrocarbyl or R^1, R^2 and R^3 taken together form a ring;

A is a π-allyl or π-benzyl group;

R^{10} and R^{15} are each independently hydrogen, hydrocarbyl or substituted hydrocarbyl;

R^{11}, R^{12}, R^{13}, R^{14}, R^{16}, R^{17}, R^{18}, R^{19}, R^{20}, R^{21}, R^{30}, R^{31}, R^{32}, R^{33}, R^{34}, R^{35}, R^{50}, R^{51}, R^{52}, R^{53} and R^{54} are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl, an inert functional group, and provided that any two of these groups vicinal to one another taken together may form a ring;

R^{22} is hydrocarbyl, substituted hydrocarbyl, —SR^{117}, —OR^{117}, or —NR^{118}_2, R^{24} is hydrogen, a functional group, hydrocarbyl or substituted hydrocarbyl, and R^{27} is hydrocarbyl or substituted hydrocarbyl, and provided that R^{22} and R^{24} or R^{24} and R^{27} taken together may form a ring;

R^{60}, R^{61}, R^{62} and R^{63} are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl, or an inert functional group;

R^{64} and R^{65} are each independently hydrogen, hydrocarbyl or substituted hydrocarbyl;

n is 1, 2 or 3;

Ar^{14}, Ar^{15}, Ar^{16}, Ar^{17}, Ar^{18} and Ar^{19} are each independently hydrocarbyl or substituted hydrocarbyl;

R^{117} is hydrocarbyl or substituted hydrocarbyl;

each R118 is independently hydrogen, hydrocarbyl or substituted hydrocarbyl;

G and L are both N or G is CR^{57} and L is CR^{55};

R^{55}, R^{56} and R^{57} are each independently hydrogen, hydrocarbyl or substituted hydrocarbyl, or any two of R^{55}, R^{56} and R^{57} taken together form a ring;

Ar^3 is hydrocarbyl or substituted hydrocarbyl;

R^{79}, R^{80}, R^{81}, R^{82}, R^{83}, R^{84}, R^{85}, R^{86}, R^{87}, R^{88} and R^{89} are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl, or a functional group;

R^{90}, R^{91}, R^{92} and R^{93} are each independently hydrocarbyl or substituted hydrocarbyl;

R^{94} and R^{95} are each independently hydrocarbyl or substituted hydrocarbyl;

R^{96}, R^{97}, R^{98}, and R^{99} are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl or a functional group;

both of T are S (sulfur) or NH (amino);

each E is N (nitrogen) or CR^{108} wherein R^{108} is hydrogen, hydrocarbyl, substituted hydrocarbyl or a functional group; independently hydrogen, hydrocarbyl, substituted hydrocarbyl, or a functional group;

R^{100}, R^{101}, R^{102}, R^{103}, R^{104}, R^{105}, R^{106} and R^{107} are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl or a functional group;

R^{109}, R^{110}, R^{111}, R^{112}, R^{113}, R^{114}, R^{115} and R^{116} are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl or a functional group;

R^{28} and R^{29} are each independently hydrogen, hydrocarbyl or substituted hydrocarbyl;

(b) a second active polymerization catalyst for said olefins which contains one or more transition metals;

(c) a least one first olefin capable of being polymerized by said first active polymerization catalyst; and

(d) at least one second olefin capable of being polymerized by said second active polymerization catalyst.

US 6,410,661 B1

STEREORIGID METALLOCENE COMPOUNDS

Walter Kaminsky, Pinneberg; Frank Kueber, Oberursel; Berthold Schiemenz, Frankfurt; Ralf Werner, Hamburg; Anne-Meike Schauwienold, Hamburg, and Frank Freidanck, Hamburg, all of Germany, assignors to Basell Polyolefine GmbH, Kehl, Germany

PCT No. PCT/EP98/02671, § 371 Date Nov. 2, 1999, § 102(e) Date Nov. 2, 1999, PCT Pub. No. WO98/50395, PCT Pub. Date Nov. 12, 1998

PCT Filed May 6, 1998, Appl. No. 423,115

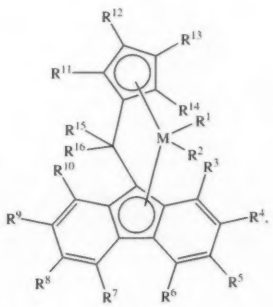
Claims priority, application Germany, May 6, 1997, 197 19 103

Int. Cl. C08F *4/44*

U.S. Cl. 526—127 **13 Claims**

1. Stereorigid metallocene compounds of the formula I,

(I)



where

M is a metal of Group IIIb, IVb, Vb or VIb of the Periodic Table of the Elements.

R^1 and R^2 are identical or different and are each hydrogen, a C_1–C_{40}-hydrocarbon-containing group, OH, halogen or NR_2, where R is halogen, C_1–C_{10}-alkyl or C_{6-C10}-aryl, or R^1 and R^2 together with the atoms linking them, form a ring system (I); R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{14}, R^{15} and R^{16} are identical or different and are each hydrogen, a C_1–C_{40}-hydrocarbon-containing group halogen, SiR^{17}_3, NR^{17}_2, $SiOR^{17}_3$, $SiSR^{17}_3$ or PR^{17}_2, where R^{17} are identical or different and are each halogen, C_1–C_{10}-alkyl or C_6–C_{10}-aryl or form a ring system (2), or two or more neighboring radicals R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{14}, R^{15} and R^{16}, together with the atoms linking them, form a ring system (3), and R^{12} and R^{13} are identical or different and are each hydrogen or a C_6–C_{30}-aryl-containing group, and at least one of the radicals R^{12} and R^{13} is not hydrogen.

US 6,410,662 B1

PROCESS FOR THE PREPARATION OF OLEFIN (CO) POLYMERS, OLEFIN COPOLYMERS, AND APPLICATION THEREOF

Tsutomu Ushioda, Ichihara; Jun Saito, Kimitsu; Mototake Tsutsui, Ichihara; Yoshitoyo Yasuda, Ichihara; Hiroyuki Fujita, Ichihara; Toshihiro Uwai, Ichihara; Yoshiyuki Ohgi, Yokoshiba-machi; Minoru Adachi, Ichihara; Yoshitaka Morimoto, Ichihara; Taketo Hirose, Ichihara; Youichi Kugimiya, Ichihara; Masahiko Taniguchi, Narita, and Hitoshi Kuramochi, Ichihara, all of Japan, assignors to Chisso Corporation, Osaka, Japan

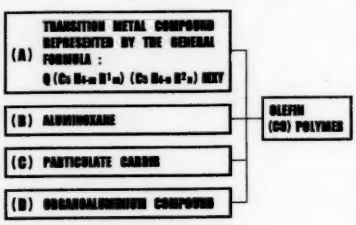
PCT No. PCT/JP98/03597, § 371 Date May 9, 2000, § 102(e) Date May 9, 2000, PCT Pub. No. WO99/07747, PCT Pub. Date Feb. 18, 1999

PCT Filed Aug. 12, 1998, Appl. No. 485,492

Claims priority, application Japan, Aug. 12, 1997, 9-217899; Aug. 13, 1997, 9-218756; Sep. 17, 1997, 9-251689; Sep. 19, 1997, 9-273577

Int. Cl. C08F *4/44*

U.S. Cl. 526—127 **24 Claims**



1. A process for producing high molecular weight olefin polymers or copolymers at a polymerization temperature within the range of 40–90° C. by the aid of a catalyst system comprised predominantly of the following compounds (A), (B) and (C), which comprises polymerizing olefin monomers by the aid of a catalyst system comprised of the compounds (A), (B) and (C) conjointly with an organoaluminum compound (D) whereby the polymerization time or an average retention time in a polymerization reactor is selected within the range of 1–20 hours to make a weight average molecular weight of the resultant olefin polymers or copolymers obtained by gel permeation chromatography adjustable within the range of 30,000–10,000;000 at need:

the compound (A) being a transition metal compound of the general formula:

$$Q(C_5H_{4-m}R^1{}_m)(C_5H_{4-n}R^2{}_n)MXY$$

wherein $(C_5H_{4-m}R^1{}_m)$ and $(C_5H_{4-n}R^2{}_n)$ each stand for a substituted cyclopentadienyl group, m and n each stands for an integer of 1–3, R^1 and R^2 may be the same or different and each stands for a hydrocarbon group with 1–20 carbon atoms, a silicon-containing hydrocarbon group, and a hydrocarbon group forming at least one hydrocarbon ring which may be substituted by hydrocarbon groups connected to two carbon atoms on the cyclopentadienyl ring, with the proviso that a symmetrical plane containing M is not existent in the position on the cyclopentadienyl ring of R^1 and R^2 and that R^1 or R^2 is existent in at least one carbon atom adjacent to the carbon atom connected to Q in at least one cyclopentadienyl ring, Q stands for a bivalent hydrocarbon radical, unsubstituted silylene radical or a hydrocarbon-substituted silylene radical bridging the groups $(C_5H_{4-m}R^1{}_m)$ and $(C_5H_{4-n}R^2{}_n)$ M stands for a transition metal Ti, Zr or Hf, and X and Y may be the same or different and each stands for a hydrogen atom, a halogen atom or a hydrocarbon group,

the compound (B) being an aluminoxane, and

the compound (C) being a finely particulate carrier.

US 6,410,663 B2

ELECTRON DONORS IN A ZIEGLER-NATTA CATALYST FOR THE PRODUCTION OF HIGH MELT FLOW COPOLYMERS

Edwar S. Shamshoum, Houston; David J. Rauscher, Webster, and Theodore G. Harris, Houston, all of Tex., assignors to Fina Technology, Inc., Houston, Tex.

Continuation of application No. 08/174,726, filed on Dec. 29, 1993, now abandoned, which is a continuation-in-part of application No. 07/895,287, filed on Jun. 8, 1992, now abandoned. This application Feb. 27, 2001, Appl. No. 794,191.

Int. Cl. C07F *4/616*

U.S. Cl. 526—128 **15 Claims**

1. A process for the copolymerization of olefins, comprising:

(a) making a catalyst by the steps comprising:

(2) selecting a conventional Ziegler-Natta catalyst component supported on a magnesium compound wherein the conventional supported Ziegler-Natta catalyst component is obtained by:

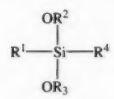
(iii) suspending a dialkoxy magnesium is an aromatic hydrocarbon that is liquid at normal temperatures;

(iv) contacting the dialkoxy magnesium with a titanium halide and further

(v) contacting the resulting composition a second time with the titanium halide, and contacting the dialkoxy magnesium with a diester of an aromatic dicarboxlic acid at some point during the treatment with the titanium halide in steo (ii); and

(2) contacting the catalyst component with an organoaluminum compound;

(3) contacting said catalyst component with an electron donor either simultaneously with or after step (2), said electron donor being described by the formula:



wherein R^1 is a linear alkyl group attached to the silicon atom; R^2 and R^3 are alkyl or aryl groups and R^4 is a linear alkyl attached to the silicon atom, R^1 and R^4 are the same or different;

(b) introducing said catalyst into a polymerization reaction zone containing ethylene and propylene under polymerization conditions; and

(c) withdrawing a copolymer product having a high melt flow index in the range of from about 15 to about 60.

US 6,410,664 B1

CATALYST COMPOSITIONS AND PROCESSES FOR OLEFIN POLYMERS AND COPOLYMERS

Donald Albert Bansleben, Columbia, Md.; Stefan K. Friedrich, San Gabriel, Calif.; Todd Ross Younkin, Pasadena, Calif.; Robert Howard Grubbs, South Pasadena, Calif.; Chunming Wang, Highland Park, N.J., and Robert Tan Li, Longview, Tex., assignors to Cryovac, Inc., Duncan, S.C.

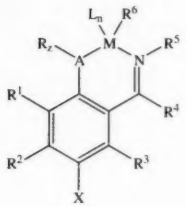
Continuation-in-part of application No. 08/822,531, filed on Mar. 24, 1997, now abandoned. This application Jan. 15, 1998, Appl. No. 7,443.

Int. Cl. C08F *4/602;4/70*

U.S. Cl. 526—141 **160 Claims**

1. A process for forming a polyolefin comprising contacting at least one olefinic compound with a catalyst composition comprising a compound represented by the general formula:

(I)



wherein

R independently represents hydrogen atom; C_1–C_{11} alkyl; aryl; or substituted aryl, provided that R represents at least one hydrogen atom, and z is 0 when A is oxygen or sulfur or z is 1 when A is nitrogen;

R^1 represents a hydrogen atom; C_1–C_{11} alkyl; aryl; substituted aryl wherein the substitution group is selected from C_1–C_4 alkyl, perfluoroalkyl, nitro, sulfonate or halo group; arylalkyl; siloxyl ((—$OSiE_3$) where E is selected from phenyl or C_1–C_4 alkyl); nitro group; sulfonate group; halo atom; or a hydrocarbyl terminated oxyhydrocarbylene group (—$(BO)_zR^7$) wherein each B independently is selected from a C_1–C_4 alkylene or an arylene group, O represents oxygen, R^7 represents a C_1–C_{11} hydrocarbyl group and z is an integer of 1 to 4);

R^2 represents hydrogen atom, aryl, substituted aryl, C_1–C_{11} alkyl, halogen atom or R^1 and R^2, together, provide a hydrocarbylene or substituted hydrocarbylene which forms an aromatic or non-aromatic carbocyclic ring;

R^3 represents hydrogen;

R^4 represents hydrogen atom, a C_1–C_{11} alkyl; an aryl; substituted aryl group; or R^3 or R^4, together, provide a hydrocarbylene or substituted hydrocarbylene forming a non-aromatic carbocyclic ring;

R^5 represents a C_1–C_{11} alkyl; cycloalkyl; aryl group; a substituted aryl having one or both ortho positions of the aromatic group substituted with a C_1–C_4 alkyl, the para position (with respect to the N—R^5 bond) substituted with a hydrogen, nitro, trifluoromethyl, halogen, methoxy, C_1–C_4 alkyl, sulfonate or fused or unfused aryl group; or a hydrocarbyl terminated oxyhydrocarbylene group (—$(BO)_2R^7$); or R^1 and R^5 together form an oxyhydrocarbylene chain, —$(BO)_mB$—, wherein each B is independently selected from a C_1–C_4 alkylene group or an arylene group and m is an integer of 1–4;

n represents an integer of 0 or 1;

R^6 represents, when n is 1, an unsubstituted or substituted aromatic group; a C_1–C_{11} alkyl; a hydrogen atom or halogen atom or when, n is 0, R^6 represents an allyl group or substituted allyl group;

L represents a coordination ligand selected from triphenylphosphine, tri(C_1–C_6 alkyl) phosphine, tricycloalkyl phosphine, diphenyl alkyl phosphine, dialkyl phenylphosphine, triphenoxyphosphine, trialkylamine, C_2–C_{20} alkene, substituted C_2–C_4 alkene, C_1–C_4 alkoxy, pyridine, di(C_1–C_3 alkyl)ether, tetrahydrofuran, or a nitrile;

X represents a hydrogen atom or an electron withdrawing group selected from NO_2, halo, sulfonate (SO_3^-), sulfonyl ester (SO_2R), carboxyl (COO^-), a perfluoroalkyl, or a carboxylic ester group;

M represents a Group VIII transition metal selected from Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt in the +2 oxidation state; and

A represents oxygen, nitrogen or sulfur;

in combination with

a Lewis base selected from ethers, esters, aldehydes, ketones, alcohols, amides, organocarbonates, organotin compounds, water and mixtures thereof.

US 6,410,665 B1

CHEMICAL COMPOUND

Cornelia Fritze, Frankfurt; Frank Küber, Oberursel, and Hans Bohnen, Niedernhausen, all of Germany, assignors to Basell Polyolefine GmbH, Germany

Division of application No. 08/867,214, filed on Jun. 2, 1997, now Pat. No. 6,255,531. This application Dec. 3, 1999, Appl. No. 456,037.

Claims priority, application Germany, Jun. 3, 1996, 196 22 207

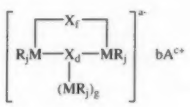
Int. Cl. C08F *4/42*

U.S. Cl. 526—160 **11 Claims**

1. A catalyst system comprising

a) at least one compound of the formula (II)

(II)



where

R are, independently of one another, identical or different and are each a halogen atom or a C_1–C_{40}-group,

X are, independently of one another, identical or different and are each a C_1–C_{40} haloalkylene, C_6–C_{40}-arylene, C_6–C_{40}-haloarylene, C_7C_{40}-haloarylalkylene, C_2–C_{40}-alkynylene, a haloalkynylene group containing up to 40 carbon atoms, C_2–C_{40}-alkenylene or C_2–C_{40}-haloalkenylene group,

M are, independently of one another, identical or different and are each an element of group IIa, IIIa, IVa, or Va of the Periodic Table of the Elements,

a is an integer from 0 to 10, b is an integer from 0 to 10, c is an integer from 0 to 10 and

if a=0 then b=0 and

if a≧1 then a=b·c,

d is 0 or 1,

f is 0 or 1,

g is 0 or 1, and when d is 0, g is 0,

j is an integer from 1 to 5 and

A is a cation of group Ia, IIa, IIIa of the Periodic Table of the Elements, a carbenium, oxonium or sulfoniun cation or a quaternary ammonium compound and

b) at least one metallocene.

US 6,410,666 B1

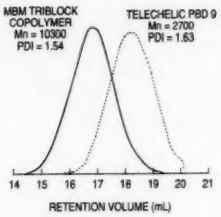
ABA TRIBLOCK AND DIBLOCK COPOLYMERS AND METHODS OF PREPARING THE SAME

Robert H. Grubbs, South Pasadena, and Christopher W. Bielawski, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

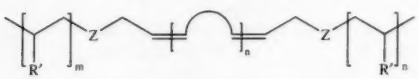
Provisional application No. 60/124,915, filed on Mar. 18, 1999. This application Mar. 17, 2000, Appl. No. 527,757.

Int. Cl. C08F *4/44;20/10;16/34;12/06*

U.S. Cl. 526—171 **29 Claims**



26. A method for preparing a triblock copolymer of the formula



comprising:

(a) contacting a cycloalkene with a chain transfer agent of the formula:

Z—Y=Y—Z

in the presence of a metal carbene metathesis catalyst to form a telechelic polymer; and

(b) contacting the telechelic polymer with an alkene of the formula

wherein

n and m are integers;

Z is an ATRP initiator;

—Y=Y— is an alkenyl group; and

R' is selected from the group consisting of aryl, nitrile and C_1–C_{20} carboxylate, wherein R' is substituted or unsubstituted; and

wherein the cycloalkene is 1,5-cyclooctadiene, Z is allyl chloride or 2-bromoisobutyrate and the alkene is styrene or methyl methacrylate.

US 6,410,667 B1

INITIATOR/AMIDINE COMPLEXES, SYSTEMS COMPRISING THE COMPLEXES, AND POLYMERIZED COMPOSITIONS MADE THEREWITH

Dean M. Moren, North St. Paul, Minn., assignor to 3M Innovative Properties Company, St. Paul, Minn.

Filed Nov. 4, 1999, Appl. No. 433,236

Int. Cl. C08F *2/00*

U.S. Cl. 526—217 **9 Claims**

1. An initiator system comprising:

a complexed initiator comprising a complex of an amidine complexing agent and an organoborane initiator; and

a decomplexer.

US 6,410,668 B1

ROBUST POLYMER COATING

Marcella Chiari, V. Gian Battisla Brocchi, 11, Milan, Italy, 20131

Provisional application No. 60/150,167, filed on Aug. 21, 1999. This application Aug. 11, 2000, Appl. No. 637,226.

Int. Cl. C08F *16/04*

U.S. Cl. 526—238.23 **32 Claims**

1. A dynamically coated microchannel comprising;

a microchannel;

a dynamic microchannel coating, said coating comprising at least one copolymer comprised of at least a first and a second copolymerized monomers, said first monomer selected from a group consisting of acrylamide, methacrylamide, N-monosubstituted acrylamide, N-monosubstituted methacrylamide, N, N-disubstituted acrylamide, and N,N-disubstituted methacrylamide; and said second monomer selected from the group consisting of glycidyl group containing monomers, diol group containing monomers and allyl group containing carbohydrate monomers.

US 6,410,669 B1

MELT-PROCESSIBLE POLY (TETRAFLUOROETHYLENE)

Paul Smith; Jeroen Visjager, both of Zurich, Switzerland; Cees Bastiaansen, Maastricht, Netherlands, and Theodorus Tervoort, Zurich, Switzerland, assignors to Eidgenössische Technische Hochschule Zürich, Zurich, Switzerland

Provisional application No. 60/095,583, filed on Aug. 6, 1998. This application Aug. 6, 1999, Appl. No. 369,319.

Int. Cl. C08F *114/18*

U.S. Cl. 526—255 **34 Claims**

1. A poly(tetrafluoroethylene) polymer having:

(i) a melt flow index between 0.25 and about 50 g/10 min;

(ii) an elongation to break of at least 10%;

(iii) a crystallinity of 1–55%;

(iv) less than 1 weight percent of co-monomer; and

(v) less than 0.5 mol % of co-monomer.

US 6,410,670 B1

PHOTORESIST MONOMER HAVING HYDROXY GROUP AND CARBOXY GROUP, COPOLYMER THEREOF AND PHOTORESIST COMPOSITION USING THE SAME

Geun Su Lee; Cha Won Koh; Jae Chang Jung; Min Ho Jung, and Ki Ho Baik, all of Kyoungki-do, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Filed Aug. 26, 1999, Appl. No. 383,861

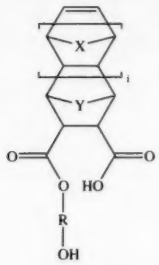
Claims priority, application Rep. of Korea, Aug. 26, 1998, 98-34694; Sep. 21, 1998, 98-39079

Int. Cl. C08J *132/08;34/00*

U.S. Cl. 526—281 **9 Claims**

1. A photoresist polymer comprising at least one monomer represented by the Chemical Formula 1 below:

Chemical Formula 1



wherein,

R is substituted or non-substituted linear or branched (C_1–C_{10})alkyl, substituted or non-substituted (C_1–C_{10})ether, substituted or non-substituted (C_1–C_{10})ester, or substituted or non-substituted (C_1–C_{10})ketone;

X and Y are independently CH_2, CH_2CH_2, oxygen or sulfur; and

i is 0 or an integer of 1 to 2.

US 6,410,671 B1

ZWITTERION DERIVATIVE AND APPLICATION TO AQUEOUS SUSPENSION PROPERTIES

Jean-François Argillier, Saint Cloud; Annie Audibert-Hayet, Croissy sur Seine; Pierre Le Perchec, and Pierre Louis Carrette, both of Lyons, all of France, assignors to Institute Francais du Petrole, Rueil-Malmaison cedex, France

PCT No. PCT/FR99/01438, § 371 Date Apr. 13, 2001, § 102(e) Date Apr. 13, 2001, PCT Pub. No. WO00/01746, PCT Pub. Date Jan. 13, 2000

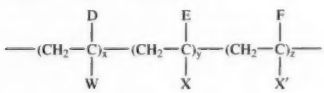
PCT Filed Jun. 15, 1999, Appl. No. 743,216

Claims priority, application France, Jul. 6, 1998, 98/08722

Int. Cl. C08F *120/54*

U.S. Cl. 526—306 **13 Claims**

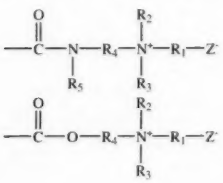
1. Hydrosoluble copolymers of substituted acrylamide or acrylate and of zwitterion monomers, characterized in that the general structure thereof is as follows:



W is a $CONH_2$ or CONHR or CONRR' or COO^- or COOR" group, where R, R' and R" are linear or branched aliphatic radicals,

D, E, F are an atom of hydrogen or a methyl group,

X and X' correspond to one of the following two formulas:

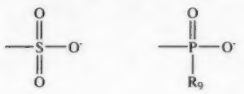


R_2 and R_3 are each a monovalent hydrocarbon radical,

R_1 is a divalent organic group comprising a linear chain consisting of carbon atoms, containing 3 to 12 carbon atoms in linear chain, optionally interrupted by 1 nitrogen atom carrying an amide function or 1 to 3 oxygen atoms and optionally comprising alkyl or hydroxyl substituents,

R_4 is a linear or branched aliphatic group and R_5 a hydrocarbon radical,

Z^- meets at least one of the following formulas corresponding to sulfobetaines and phosphobetaines respectively:



R_9 is a methyl, phenyl or alkoxy radical,

and in that at least the sulfobetaines are synthesized in the absence of salts, x, y, z molar percentage and y+z not equal to zero and y+z at most equal to 40% in relation to x+y+z.

US 6,410,672 B1

ION EXCHANGE AND ELECTROCHEMICAL METHODS AND DEVICES EMPLOYING ONE-STEP QUATERNIZED AND POLYMERIZED ANION SELECTIVE POLYMERS

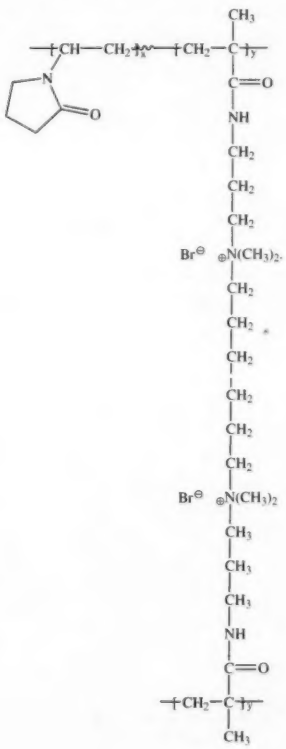
Russell J. MacDonald, Wilmington, and James A. Lech, Somerville, both of Mass., assignors to Ionics, Incorporated, Watertown, Mass.

Filed Jul. 28, 1999, Appl. No. 362,591

Int. Cl. C08F *12/28*

U.S. Cl. 526—310 **8 Claims**

1. A compound having the formula



US 6,410,673 B1

ETHYLENE/AROMATIC VINYL COPOLYMER AND MOLDED PRODUCT THEREOF

Toru Arai; Masataka Nakajima; Toshiaki Otsu; Takeshi Oda; Takanori Naoe, and Yukiko Nishitoba, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

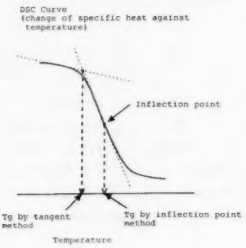
PCT No. PCT/JP99/05733, § 371 Date Jun. 19, 2000, § 102(e) Date Jun. 19, 2000, PCT Pub. No. WO00/23484, PCT Pub. Date Apr. 27, 2000

PCT Filed Oct. 18, 1999, Appl. No. 581,812

Claims priority, application Japan, Oct. 19, 1998, 10-29755; Mar. 15, 1999, 11-68662; Apr. 2, 1999, 11-96002

Int. Cl. C08F *212/02*

U.S. Cl. 526—347 **21 Claims**



1. An ethylene-aromatic vinyl compound copolymer characterized by satisfying the following conditions:

(1) the aromatic vinyl compound content is from 0.5 mol % to 10 mol %;

(2) as measured with respect to a molded product having a thickness of 0.2 mm, the haze is at most 14%, or the total light transmittance is at least 90%;

(3) an ethylene-aromatic vinyl compound copolymer characterized in that the relation of the aromatic vinyl compound content and the glass transition point (Tg) obtained by an inflection point method as observed at a temperature of at least −50° C. by a differential scanning calorimeter (DSC), satisfies the following formula (1):

$$-20+1.00St>Tg>-30+1.05St \qquad \text{Formula (1)}$$

wherein St represents the aromatic vinyl compound content (molar fraction %) in the copolymer; and

(4) the weight average molecular weight is from 140,000 to 500,000 when the aromatic vinyl compound content is from 5 mol % to 10 mol % and from 60,000 to 500,000 when the content is from 0.5 mol % to less than 5 mol %.

US 6,410,674 B2

INTERMEDIATE PRODUCT FOR MANUFACTURING LIGAIN POLYMERS AND IT'S USE IN MANUFACTURING REAGENTS FOR MAKING COMPOSITE MATERIALS FROM PLANT FIBERS, WATERPROOF PAPERS AND CARDBOARDS, AND THERMOSETTING PLASTICS FROM DERIVATIVES

Aloys Hüttermann; Andrzej Majcherczyk; Carsten Mai, all of Göttingen; Annette Braun-Lüllemann, Bovenden; Merle Fastenrath, and Sonja Noetzold, both of Göttingen, all of Germany, assignors to Stockhausen GmbH & Co. KG, Krefeld, Germany

PCT No. PCT/EP98/00254, § 371 Date Feb. 4, 2000, § 102(e) Date Feb. 4, 2000, PCT Pub. No. WO98/33848, PCT Pub. Date Aug. 6, 1998

PCT Filed Jan. 19, 1998, Appl. No. 341,487

Claims priority, application Germany, Jan. 14, 1997, 197 00 904; Jan. 14, 1997, 197 00 906; Jan. 14, 1997, 197 00 902

Int. Cl. C08L *97/00*

U.S. Cl. 527—403 **10 Claims**

1. Method for manufacturing polymers of lignin-based compounds from the pulp industry by treating the lignin-based compounds with phenol oxidizing enzymes in the presence of oxidation agents, characterized in that the lignin-based compounds are:

(a) subjected to enzyme treatment for more than 3 hours in the presence of air, or

(b) subjected to enzyme treatment for more than 10 minutes while air or oxygen is being passed through them, or

(c) oxidized by treatment with chemical oxidation agents,

and that the activated intermediate product thus obtained is caused to react with non-activated lignin-based compounds while polymeric lignin products are formed.

US 6,410,675 B2

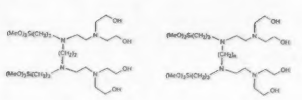
FUNCTIONALIZED SILICON COMPOUNDS AND METHODS FOR THEIR SYNTHESIS AND USE

Glenn McGall, Mountain View, and Jonathan Eric Forman, San Jose, both of Calif., assignors to Affymetrix, Inc., Santa Clara, Calif.

Division of application No. 09/418,044, filed on Oct. 13, 1999, which is a continuation-in-part of application No. 09/172,190, filed on Oct. 13, 1998, now Pat. No. 6,262,216. This application Apr. 11, 2001, Appl. No. 832,490.

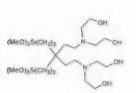
Int. Cl. C08G *77/00;77/04;* **C12Q** *1/68;* **C07H** *19/00;* **G01N** *15/06*

U.S. Cl. 528—10 **9 Claims**



VI

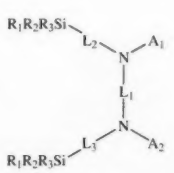
Formula 6a



VII

1. A method of functionalizing a surface, comprising a covalently attaching to the surface a functionalized silicon compound having a structure of Formula 3:

Formula 3



wherein R_1 and R_2 are independently selected from the group consisting of alkoxy or halide, and R_3 is selected from the group consisting of alkoxy, halide and alkyl;

wherein L_1, L_2, and L_3 are independently $-(CH_2)_n-$, wherein n is 2–10; and

wherein A_1 and A_2 are independently a moiety comprising one or more derivatizable functional groups or modified forms thereof.

US 6,410,676 B1

METHOD FOR PRODUCING POLYOXYALKYLENE POLYOL AND DERIVATIVES THEREOF

Satoshi Yamasaki; Yasunori Hara; Tamotsu Kunihiro; Fumio Yamazaki; Mikio Matsufuji; Ariko Nishikawa; Shinsuke Matsumoto; Tsukuru Izukawa, all of Aichi; Masahiro Isobe, Kanagawa; Kazuhiko Ohkubo, Kanagawa, and Kaoru Ueno, Kanagawa, all of Japan, assignors to Mitsui chemicals, Inc., Japan

PCT No. PCT/JP99/05743, § 371 Date May 30, 2000, § 102(e) Date May 30, 2000, PCT Pub. No. WO00/23500, PCT Pub. Date Apr. 27, 2000

PCT Filed Oct. 19, 1999, Appl. No. 555,338

Claims priority, application Japan, Oct. 20, 1998, 10-297777; Oct. 23, 1998, 10-301872; Nov. 12, 1998, 10-321224; Nov. 16, 1998, 10-324599; Aug. 4, 1999, 11-220628

Int. Cl. C08G *18/48*

U.S. Cl. 528—76 **27 Claims**

1. A method for producing a polyoxyalkylene polyol wherein a crude polyoxyalkylene polyol is produced by addition polymerization of an epoxide compound to an active hydrogen compound using as a catalyst a compound having a P═N bond, thereafter, the crude polyoxyalkylene polyol is allowed to contact with a solid acid having a specific surface area of 450 to 1200 m^2/g and an average pore diameter of 40 to 100 Å to control the catalyst-remaining amount in the polyoxyalkylene polyol to 150 ppm or less.

US 6,410,677 B1

RESIN COMPOSITION FOR INSULATING MATERIAL, AND INSULATING MATERIAL PRODUCED FROM SAID RESIN COMPOSITION

Takashi Enoki, Yokohama; Nobuhiro Higashida, Kawasaki, and Mitsuru Murata, Yokohama, all of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Sep. 27, 2000, Appl. No. 670,867

Claims priority, application Japan, Sep. 28, 1999, 11-275323

Int. Cl. C08G *73/00;73/12;73/22*

U.S. Cl. 528—170 **7 Claims**

1. A resin composition for insulating material, consisting essentially of:

(A) a compound having an amphipathic property, and

(B) a heat-resistant resin having a glass transition temperature higher than thermal decomposition temperature of the compound (A), or precursor thereof, wherein

the compound (A) can give rise to phase separation against the heat-resistant resin or the pre-cursor thereof at a temperature lower than the thermal decomposition temperature of the compound (A) and can be thermally decomposed at a temperature not lower than the thermal decomposition temperature of the compound (A).

US 6,410,678 B1

AROMATIC POLYCARBONATE, PRODUCTION METHOD AND MOLDED PRODUCTS THEREOF

Makoto Ishida; Koji Ishihata; Koji Maeda, all of Tokyo; Wataru Funakoshi, Iwakuni; Hiroaki Kaneko, Iwakuni; Yuichi Kageyama, Iwakuni, and Katsushi Sasaki, Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP00/08415, § 371 Date Aug. 1, 2001, § 102(e) Date Aug. 1, 2001, PCT Pub. No. WO01/40352, PCT Pub. Date Jun. 7, 2001

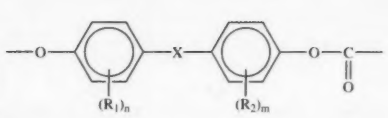
PCT Filed Nov. 29, 2000, Appl. No. 890,465

Claims priority, application Japan, Dec. 3, 1999, 11-344724; Dec. 3, 1999, 11-344725; Dec. 3, 1999, 11-344726; Dec. 3, 1999, 11-344727; Dec. 3, 1999, 11-344728; Jan. 5, 2000, 2000-000277

Int. Cl. C08G *64/00*

U.S. Cl. 528—196 **23 Claims**

1. An aromatic polycarbonate which comprises a main recurring unit represented by the following formula (1):



(1)

wherein R_1 and R_2 are each independently alkyl group having 1 to 20 carbon atoms, alkoxy group having 1 to 20 carbon atoms, cycloalkyl group having 6 to 20 carbon atoms, aryl group having 6 to 20 carbon atoms, cycloalkoxy group having 6 to 20 carbon atoms or aryloxy group having 6 to 20 carbon atoms, m and n are each independently an integer of 0 to 4, and X is a single bond, oxygen atom, carbonyl group, alkylene group having 1 to 20 carbon atoms, alkylidene group having 2 to 20 carbon atoms, cycloalkylene group having 6 to 20 carbon atoms, cycloalkylidene group having 6 to 20 carbon atoms, arylene group having 6 to 20 carbon atoms or alkylene-arylene-alkylene group having 6 to 20 carbon atoms, and terminal groups consisting essentially of aryloxy groups (A) and phenolic hydroxyl groups (B), the (A)/(B) molar ratio being 95/5 to 40/60, and which has a melt viscosity stability measured under a nitrogen stream at a shear rate of 1 rad./sec and 300° C. for 30 minutes of 0.5% or less, a sodium metal element content of 100 ppb or less and a content of each of first elements, Ni, Pb, Cr, Mn and Fe of 70 ppb or less, and wherein the relationship between the concentration (H) (eq./ton-polycarbonate) of terminal hydroxyl groups and the total content (Σfirst elements) (ppb) of the first elements is represented by (H)≦Σfirst elements.

US 6,410,679 B1

CATIONIC COMPLEXES OF POLYOXYALKYLENE GLYCOL DICARBOXYLATES

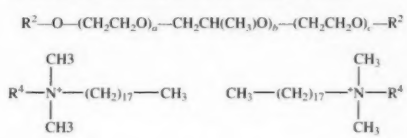
Anthony J. O'Lenick, Jr., Dacula, Ga., and Charles W. Buffa, Paterson, N.J., assignors to Biosil Research Institute, Paterson, N.J.

Continuation-in-part of application No. 09/425,896, filed on Oct. 25, 1999, now abandoned. This application Jul. 7, 2000, Appl. No. 611,979.

Int. Cl. C08G *63/127;63/13*

U.S. Cl. 528—288 **4 Claims**

1. A complex conforming to the following structure;

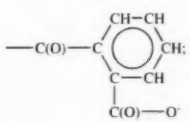


wherein;

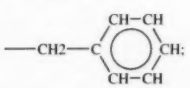
R^2 is selected from the group consisting of;

—C(O)—CH_2—CH_2—C(O)—O^-;

—C(O)—CH═CH—C(O)—O^-; and



R^4 is CH_3 or



a, b and c are integers each independently ranging from 0 to 20.

US 6,410,680 B1

DENDRIMER CONSTRUCTS AND METAL COMPLEXES THEREOF HAVING SUPEROXIDE DISMUTASE ACTIVITY

Shigeo Kubota, San Francisco, Calif., assignor to DendriMolecular, Inc., San Carlos, Calif.

Filed Jun. 21, 2000, Appl. No. 602,630

Int. Cl. C08G *73/00;* **A61K** *51/00*

U.S. Cl. 528—310 **23 Claims**

1. A metal-dendrimer complex having superoxide dismutase-like activity, comprising a dendrimer construct having a globular shape defining a surface, and having at least one metal ion complexed at a metal ion binding site situated within the volume defined by the surface of the construct, sufficiently deeply to impede diffusion from the metal ion binding site to the milieu surrounding the dendrimer construct surface of any hydroxyl radical generated by reaction of superoxide radical at said metal ion binding site.

US 6,410,681 B1

PROCESS FOR THE PREPARATION OF A POLYESTERAMIDE

Ashutosh Anant Kelkar; Shrikant Madhukar Kulkarni, and Raghunath Vitthal Chaudhari, all of Maharashtra, India, assignors to Council of Scientific and Industrial Research, New Delhi, India

Filed Jan. 30, 2001, Appl. No. 774,247

Int. Cl. C08G *69/08*

U.S. Cl. 528—310 **14 Claims**

1. A process for the preparation of an alternating polyesteramide comprising contacting an aromatic dihalide of the general formula (I) X1—Ar—X2 wherein Ar is an aromatic or heteroaromatic residue, X1 and X2 are halogens, with an aminohydroxy compound of the general formula (II) H_2N—R—OH wherein R is an alkyl, cycloalkyl, aromatic or heteroaromatic residue; in the presence of carbon monoxide, a catalyst, base and solvent to obtain the desired product.

US 6,410,682 B1

POLYMERIC AMINE FOR A GAS GENERATING MATERIAL

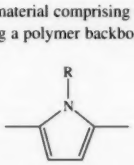
Harold R. Blomquist, Gilbert, Ariz., assignor to TRW Inc., Lyndhurst, Ohio

Filed Jan. 3, 2001, Appl. No. 753,442

Int. Cl. C08G *67/02;73/00;* **C06B** *47/08*

U.S. Cl. 528—392 **13 Claims**

1. A gas generating material comprising a polymeric amine, said polymeric amine having a polymer backbone that includes units of



wherein R is a nitrogen containing organic radical of a nitrogen containing organic fuel that includes a primary amino group.

US 6,410,683 B1

POLYMER DEVOLATILIZATION PROCESS

Thomas Orr Craig, Cheshire, United Kingdom, assignor to Nova Chemicals Europe Limited, United Kingdom

Filed Feb. 25, 2000, Appl. No. 513,636

Claims priority, application United Kingdom, Mar. 3, 1999, 9904897

Int. Cl. C08F *6/00*

U.S. Cl. 528—480 **8 Claims**

1. A process for the removal of impurities from a thermoplastic polymer, comprising mixing with the polymer in a molten state a stripping agent comprising a solution of carbon dioxide in water, passing the mixture to a vessel held at a pressure in the range of 1 to 30 mmHg (1.333×102 to about 4×103 Pa) allowing impurities to diffuse out of the polymer into the volatilized stripping agent, and removing the volatilized stripping agent with the impurities from the mixture.

US 6,410,684 B1

SERINE PROTEASE INHIBITORS

Anton Egbert Peter Adang, Eindhoven, Netherlands, assignor to Akzo Nobel N.V., Arnhem, Netherlands

PCT No. PCT/EP97/00938, § 371 Date Sep. 1, 1998, § 102(e) Date Sep. 1, 1998, PCT Pub. No. WO97/31937, PCT Pub. Date Sep. 4, 1997

PCT Filed Feb. 26, 1997, Appl. No. 142,110

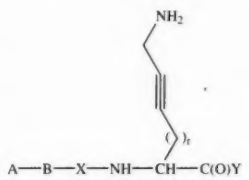
Claims priority, application European Pat. Off., Mar. 1, 1996, 96200543

Int. Cl. C07K *5/08*

U.S. Cl. 530—331 **17 Claims**

1. A serine protease inhibitor compound having the Formula I

(I)



wherein

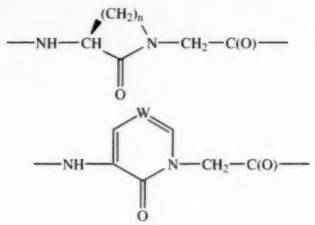
A is H, substituted or unsubstituted D,L α-hydroxyacetyl, R^1, R^1—O—C(O)—, R^1—C(O)—, R^1—SO_2—, R^2OOC—$(CHR^2)_m$—SO_2—, R^2OOC—$(CHR^2)_m$—, H_2NCO—$(CHR^2)_m$—, or an N-protecting group, wherein R^1 is selected from (1–12C)alkyl, (2–12C)alkenyl, (2–12C)alkynyl and (3–8C)cycloalkyl, which groups may be substituted with (3–8C)cycloalkyl, (1–6C)alkoxy, oxo, OH, COOH, CF_3, or halogen, and from (6–14C)aryl, (7–15C)aralkyl and (8–16C)aralkenyl, the aryl groups of which may be substituted with (1–6C)alkyl, (3–8C)cycloalkyl, (1–6C)alkoxy, OH, COOH, CF_3 or halogen; each group R^2 is independently H or has the same meaning as R^1, m is 1, 2 or 3;

B is a bond, an amino acid of the formula —NH—CH[$(CH_2)_p$C(O)OH]—C—(O)— or an ester derivative thereof with p being 0, 1, 2 or 3, —N((1–12C)alkyl)—CH_2—CO—, —N((2–12C)alkenyl)—CH_2—CO—, —N((2–12C)alkynyl)—CH_2—CO—, —N(benzyl)CH_2—CO—, D-1-Tiq, D-3-Tiq, D-Atc, Aic, D-1-Piq, D-3-Piq or a L- or D-amino acid having a hydrophobic, basic or neutral side chain, which amino acid may be N-(1–6C)alkyl substituted;

or A and B together are residue R^3R^4N—CHR^5—C(O)—, wherein R^3 and R^4 independently are R^1, R^1—O—C(O)—, R^1—C(O)—, R^1SO_2—, R^2OOC—$(CHR^2)_m$—SO_2—, R^2OOC—$(CHR^2)_m$—, H_2NCO—$(CHR^2)_m$, or an N-protecting group, or one of R^3 and R^4 is connected with R^5 to form a 5- or 6-membered ring together with "N—C" to which they

are bound, which ring may be fused with an aliphatic or aromatic 6-membered ring; and R^5 is a hydrophobic, basic or neutral side chain;

X is an L-amino acid with a hydrophobic side chain, serine, threonine, a cyclic amino acid that may contain an additional heteroatom selected from N, O and S, and may be substituted with (1–6C)alkyl, (1–6C)alkoxy, benzyloxy or oxo, or X is $—NR^2—CH_2—C(O)—$ or the fragment



wherein n is 2, 3 or 4, and W is CH or N;

Y is H, $—CHF_2$, $—CF_3$, —CO—NH-(1–6C)alkylene-C_6H_5, $—COOR^6$ with R^6 being H or (1–6C)alkyl, $—CONR^7R^8$ with R^7 and R^8 being independently H or (1–6C)alkyl or R^7 and R^8 together being (3–6C)alkylene, or Y is a heterocycle selected from 2-thiazole, 2-thiazoline, 2-benzothiazole, 2-oxazole, 2-oxazoline and 2-benzoxazole, which heterocyles may be substituted with (1– 6C)alkyl, phenyl, (1–6C)alkoxy, benzyloxy or oxo;

and r is 0, 1, 2 or 3;

or a compound of formula I, wherein the substituent variables are as defined above, and wherein the amino group of the alkynylamino side chain is protected with a substituent selected from the group consisting of hydroxy, (C_{1-6})alkoxy, and (C_{1-6}) alkoxy carbonyl; or a salt thereof.

US 6,410,685 B1

ANTISTRESS AGENTS AND FUNCTIONAL FOODS

Akihiro Masuyama, Yokohama, and Toshiaki Takano, Kawasaki, both of Japan, assignors to Calpis Co., Ltd., Tokyo, Japan

PCT No. PCT/JP98/00480, § 371 Date Mar. 15, 2000, § 102(e) Date Mar. 15, 2000, PCT Pub. No. WO99/16461, PCT Pub. Date Apr. 8, 1999

PCT Filed Feb. 5, 1998, Appl. No. 508,777

Claims priority, application Japan, Sep. 26, 1997, 9-262422

Int. Cl. C07K *5/08*

U.S. Cl. 530—331 **1 Claim**

1. A method of mitigating at least one symptom of stress in a mammal, wherein said symptom is selected from the group consisting of (a) reduction of noradrenaline production, (b) reduction of dopamine production, (c) reduction of interleukin-2 production (d) a decrease in the weight of the thymus and spleen, (e) a decrease in mitogen reactivity of spleen cells, and (f) a decrease in the Fischer ratio, said method comprising administering the tripeptide Ile-Pro-Pro or the tripeptide Val-Pro-Pro to a mammal which has been subjected to stress for a time and under conditions effective to increase noradrenaline production, increase dopamine production, increase interleukin-2 production, increase the weight of the thymus and spleen, increase the mitogen reactivity of spleen cells, or increase the Fischer ratio, wherein the Fischer ratio is the ratio of branched-alkyl to aromatic amino acids.

US 6,410,686 B1

GALANIN RECEPTOR 2 PROTEIN

Brian T. Bloomquist, New Haven; Michael L. McCaleb, Madison; Linda J. Cornfield, Hamden, and Heeja Yoo-Warren, Orange, all of Conn., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Jun. 5, 1996, Appl. No. 665,034

Int. Cl. C07K *14/705;* **C12N** *5/10;15/12;15/63*

U.S. Cl. 530—350 **2 Claims**

1. A purified and isolated galanin receptor 2 (GalR2) protein comprising SEQ ID NO:2.

US 6,410,687 B1

POLYPEPTIDES FOR THE DETECTION OF MICROTUBULE DEPOLYMERIZATION INHIBITORS

Ronald D. Vale, and James J. Hartman, both of San Francisco, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Provisional application No. 60/081,734, filed on Apr. 14, 1998. This application Apr. 13, 1999, Appl. No. 291,170.

Int. Cl. C07K *1/00;14/00;17/00;16/00;* **A61K** *35/14*

U.S. Cl. 530—350 **4 Claims**

1. A polypeptide having microtubule severing activity, said polypeptide comprising an isolated p60 subunit of katanin encoded by a nucleic acid that hybridizes with the complement of a nucleic acid that encodes the polypeptide of SEQ ID NO:1, when incubated in 50% formamide for about 8 to 16 hours at 42° C.

US 6,410,688 B1

DEF1

Michael Arthur Lonetto, Collegeville; Richard Lloyd Warren, Blue Bell, and Daniel Robert Sylvester, Phoenixville, all of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Division of application No. 08/911,844, filed on Aug. 15, 1997, Provisional application No. 60/048,706, filed on May 21, 1997. This application Aug. 13, 1999, Appl. No. 373,953.

Int. Cl. C07K *1/00;17/00;5/00;* **A61K** *39/085;38/00*

U.S. Cl. 530—350 **14 Claims**

1. An isolated polypeptide comprising SEQ ID NO:2.

US 6,410,689 B1

CASPASE RECRUITMENT DOMAIN POLYPEPTIDES

John Bertin, Watertown, Mass., assignor to Millennium Pharmaceuticals, Inc., Cambridge, Mass.

Division of application No. 09/019,942, filed on Feb. 6, 1998, now Pat. No. 6,033,855. This application Dec. 22, 1999, Appl. No. 470,271.

Int. Cl. C07K *5/00;14/00*

U.S. Cl. 530—350 **12 Claims**

1. An isolated polypeptide selected from the group consisting of:

a) a polypeptide comprising the amino acid sequence of SEQ ID NO:1;

b) a polypeptide comprising at least 50 contiguous amino acids of SEQ ID NO:1;

c) a polypeptide comprising amino acids from about 1 to about 300 of SEQ ID NO:1;

d) a polypeptide comprising amino acids from about 301 to about 431 of SEQ ID NO:1;

e) a polypeptide comprising amino acids from about 432 to about 540 of SEQ ID NO:1;

f) a polypeptide comprising at least 15 contiguous amino acids of the linker domain of SEQ ID NO:1, wherein said linker domain comprises about amino acid 301 to about amino acid 431 of SEQ ID NO:1; and

g) a polypeptide comprising at least 15 contiguous amino acids of the CARD domain of SEQ ID NO:1, wherein said CARD

domain comprises about amino acid 432 to about amino acid 540 of SEQ ID NO:1.

US 6,410,690 B1

THERAPEUTIC COMPOUNDS COMPRISED OF ANTI-FC RECEPTOR ANTIBODIES

Yashwant M. Deo, Audubon, Pa.; Joel Goldstein, Piscataway; Robert Graziano, Frenchtown, both of N.J., and Chezian Somasundaram, Allentown, Pa., assignors to Medarex, Inc., Princeton, N.J.

Filed Jun. 7, 1995, Appl. No. 484,172

This patent is subject to a terminal disclaimer.

Int. Cl. C12P *21/08;* **C07K** *16/06;16/18;16/28*

U.S. Cl. 530—387.3 **17 Claims**

1. A bispecific molecule capable of mediating antibody dependent cellular cytotoxicity comprising a humanized monoclonal antibody 22 or an antigen binding fragment thereof produced by a cell line having accession number CRL11177, and human epidermal growth factor.

2. A bispecific molecule capable of mediating antibody dependent cellular cytotoxicity comprising a humanized monoclonal antibody 22 or an antigen binding fragment thereof produced by a cell line having accession number CRL11177, and bombesin.

3. A bispecific molecule capable of mediating antibody dependent cellular cytotoxicity comprising a humanized monoclonal antibody 22 or an antigen binding fragment thereof produced by a cell line having accession number CRL11177, and heregulin.

7. A multispecific molecule capable of mediating antibody dependent cellular cytotoxicity comprising:

a portion which binds to an Fc receptor on an effector cell;

a portion which binds to HER 2/neu; and

a portion which binds to an epidermal growth factor receptor (EGFR).

US 6,410,691 B1

RECEPTOR PROTEIN FOR HUMAN B CELL STIMULATORY FACTOR-2

Tadamitsu Kishimoto, 5-31, Nakanocho 3-chome, Tondabayashi-shi, Osaka, Japan

Division of application No. 08/863,196, filed on May 27, 1997, now Pat. No. 5,990,282, which is a continuation of application No. 08/444,296, filed on May 18, 1995, now Pat. No. 5,851,793, which is a division of application No. 07/907,650, filed on Jul. 2, 1992, now Pat. No. 5,480,796, which is a division of application No. 07/298,694, filed on Jan. 19, 1989, now Pat. No. 5,171,840. This application Aug. 17, 1999, Appl. No. 375,416.

Claims priority, application Japan, Jan. 22, 1988, 63-012387; Jan. 25, 1988, 63-012599; Aug. 4, 1988, 63-194885; Jan. 14, 1989, 1-7461

Int. Cl. C07K *16/28*

U.S. Cl. 530—388.22 **3 Claims**

1. An antibody to human B cell stimulating factor-2 receptor protein wherein the antibody specifically binds to the human B cell stimulating factor-2 consisting of an amino acid sequence selected from the group consisting of amino acid 20 to amino acid 468, amino acid sequence 20 to amino acid 27 and amino acid 110 to amino acid 468, amino acid sequence 20 to amino acid 323 and amino acid 20 to amino acid 344, in the following amino acid sequence (I):

Met Leu Ala Val Gly Cys Ala Leu Leu Ala Ala

Leu Leu Ala Ala Pro Gly Ala Ala Leu Ala Pro

Arg Arg Cys Pro Ala Gln Glu Val Ala Arg Gly

-continued

Val Leu Thr Ser Leu Pro Gly Asp Ser Val Thr

Leu Thr Cys Pro Gly Val Glu Pro Glu Asp Asn

Ala Thr Val His Trp Val Leu Arg Lys Pro Ala

Ala Gly Ser His Pro Ser Arg Trp Ala Gly Met

Gly Arg Arg Leu Leu Leu Arg Ser Val Gln Leu

His Asp Ser Gly Asn Tyr Ser Cys Tyr Arg Ala

Gly Arg Pro Ala Gly Thr Val His Leu Leu Val

Asp Val Pro Pro Glu Glu Pro Gln Leu Ser Cys

Phe Arg Lys Ser Pro Leu Ser Asn Val Val Cys

Glu Trp Gly Pro Arg Ser Thr Pro Ser Leu Thr

Thr Lys Ala Val Leu Leu Val Arg Lys Phe Gln

Asn Ser Pro Ala Glu Asp Phe Gln Glu Pro Cys

Gln Tyr Ser Gln Glu Ser Gln Lys Phe Ser Cys

Gln Leu Ala Val Pro Glu Gly Asp Ser Ser Phe

Tyr Ile Val Ser Met Cys Val Ala Ser Ser Val

Gly Ser Lys Phe Ser Lys Thr Gln Thr Phe Gln

Gly Cys Gly Ile Leu Gln Pro Asp Pro Pro Ala

Asn Ile Thr Val Thr Ala Val Ala Arg Asn Pro

Arg Trp Leu Ser Val Thr Trp Gln Asp Pro His

Ser Trp Asn Ser Ser Phe Tyr Arg Leu Arg Phe

Glu Leu Arg Tyr Arg Ala Glu Arg Ser Lys Thr

Phe Thr Thr Trp Met Val Lys Asp Leu Gln His

His Cys Val Ile His Asp Ala Trp Ser Gly Leu

Arg His Val Val Gln Leu Arg Ala Gln Glu Glu

Phe Gly Gln Gly Glu Trp Ser Glu Trp Ser Pro

Glu Ala Met Gly Thr Pro Trp Thr Glu Ser Arg

Ser Pro Pro Ala Glu Asn Glu Val Ser Thr Pro

Met Gln Ala Leu Thr Thr Asn Lys Asp Asp Asp

Asn Ile Leu Phe Arg Asp Ser Ala Asn Ala Thr

Ser Leu Pro Val Gln Asp Ser Ser Ser Val Pro

Leu Pro Thr Phe Leu Val Ala Gly Gly Ser Leu

Ala Phe Gly Thr Leu Leu Cys Ile Ala Ile Val

Leu Arg Phe Lys Lys Thr Trp Lys Leu Arg Ala

Leu Lys Glu Gly Lys Thr Ser Met His Pro Pro

Tyr Ser Leu Gly Gln Leu Val Pro Glu Arg Pro

Arg Pro Thr Pro Val Leu Val Pro Leu Ile Ser

Pro Pro Val Ser Pro Ser Ser Leu Gly Ser Asp

Asn Thr Ser Ser His Asn Arg Pro Asp Ala Arg

Asp Pro Arg Ser Pro Tyr Asp Ile Ser Asn Thr

Asp Tyr Phe Phe Pro Arg,

(C-terminal).

US 6,410,692 B2

REMOVAL OF ABUNDANT INTERFERING PROTEINS FROM A LIQUID SAMPLE USING A COLLAPSIBLE AFFINITY MATRIX

Anthony C. Stevens, San Diego, Calif., assignor to NovaDx, Inc., San Diego, Calif.

Filed Feb. 2, 1998, Appl. No. 17,284

Int. Cl. C07K *16/00*

U.S. Cl. 530—388.25 **9 Claims**

1. A monoclonal antibody, wherein the monoclonal antibody is HSA2126NX.012 having ATCC accession No. HB12464.

US 6,410,693 B1

INHIBITORS OF THE JNK SIGNAL TRANSDUCTION PATHWAY AND METHODS OF USE

Roger J. Davis, 53 Hickory Dr., Princeton, Mass. 01541, and Martin Dickens, Top Flat, 85 Coronation Road, Southville, Bristol B53 1AT, United Kingdom

Division of application No. 08/819,177, filed on Apr. 28, 1997, now Pat. No. 6,043,083. This application Oct. 18, 1999, Appl. No. 419,587.

Int. Cl. C07K *16/00*

U.S. Cl. 530—388.26 **15 Claims**

1. A substantially pure JNK-interacting protein 1 (JIP-1) polypeptide, the amino acid sequence of which comprises SEQ ID NO:1, or SEQ ID NO:1 with at least one conservative amino acid substitution, wherein the polypeptide specifically inhibits the activity of c-Jun NH_2 terminal kinase (JNK).

US 6,410,694 B1

METHOD FOR SOLUBILIZATION AND NATURATION OF SOMATOTROPINS

S. Bradley Storrs, Wildwood; Jacob S. Tou, Ballwin, and Jessica Marie Ballinger, Wildwood, all of Mo., assignors to Monsanto Technology LLC, St. Louis, Mo.

Division of application No. 09/002,565, filed on Dec. 31, 1997, now Pat. No. 6,034,224, Provisional application No. 60/034,808, filed on Dec. 31, 1996, now abandoned. This application Dec. 15, 1999, Appl. No. 461,784.

Int. Cl. C07K *1/02;1/14;1/34*

U.S. Cl. 530—399 **13 Claims**

1. A method for the naturation of a somatotropin comprising:

contacting a somatotropin with a detergent composition in water to provide a somatotropin solution at pH of about 8 to about 13, the detergent composition consists essentially of C_{10} alkyl sulfate present at about 0.2% to about 5%, by weight, of the total solution; and, removing the detergent from the naturated somatotropin solution by diafiltration.

US 6,410,695 B1

INDIVIDUAL MEDICAMENT DOSING CONJUGATE

Hannsjörg Sinn, Wiesloch; Wolfgang Maier-Borst, Dossenheim; Hans-Hermann Schrenk, Zeiskam, and Gerd Stehle, Heidelberg, all of Germany, assignors to Deutsches Krebsforschungszentrum Stiftung Des Öffentlichen Rechts, Heidelberg, Germany

PCT No. PCT/DE96/00267, § 371 Date Feb. 9, 1998, § 102(e) Date Feb. 9, 1998, PCT Pub. No. WO96/25956, PCT Pub. Date Aug. 29, 1996

PCT Filed Feb. 21, 1996, Appl. No. 913,217

Claims priority, application Germany, Feb. 21, 1995, 195 05 960

Int. Cl. C07K *1/00;* **A61K** *47/48;49/02*

U.S. Cl. 530—402 **9 Claims**

1. A conjugate of an active substance, a compound having a binding site for metal compounds and an albumin carrier, wherein the compound is diethylenetriaminepentaacetate, and the active substance is mitoxantrone or 1,4,5,8-tetraaminoanthraquinone.

US 6,410,696 B1

CYCLOSPORIN IMMUNOASSAY

Dariush Davalian, San Jose; Maureen H. Beresini, Moss Beach; Svetlana Alexander, Sunnyvale; Mae Wan-Leng Hu, Los Altos, and Edwin F. Ullman, Atherton, all of Calif., assignors to Dade Behring Marburg GmbH, Marburg, Germany

Continuation of application No. 08/402,296, filed on Mar. 10, 1995, now Pat. No. 6,190,873, which is a division of application No. 08/044,561, filed on Apr. 7, 1993, now abandoned, which is a continuation of application No. 07/616,116, filed on Nov. 20, 1990, now abandoned, said application No. 08/402,296 is a continuation of application No. 08/401,827, filed on Mar. 10, 1995, now Pat. No. 6,054,303. This application Nov. 13, 2000, Appl. No. 710,349.

This patent is subject to a terminal disclaimer.

Int. Cl. C07K *17/06;* **C12N** *9/96;* **G01N** *33/533;33/535*

U.S. Cl. 530—405 **1 Claim**

1. A compound useful in an immunological determination comprising a cyclosporin conjugated to an organic compound; wherein said cyclosporin has been modified at an alanine nitrogen by the attachment of a chain of at least 5 atoms, and wherein the cyclosporin is attached to the organic compound by the chain of at least 5 atoms, and further wherein the organic compound is a label, an immunogenic carrier, or a labeled immunogenic carrier.

US 6,410,697 B1

PROCESS FOR PURIFYING HUMAN LEUKOCYTE INTERFERON

Kurt Frimann Berg, Risskov, Denmark, assignor to Schering Corporation, Madison, N.J.

Division of application No. 08/243,422, filed on May 16, 1994, now abandoned, which is a continuation of application No. 08/015,661, filed on Feb. 19, 1993, now abandoned, which is a continuation of application No. 07/752,884, filed on Aug. 26, 1991, now abandoned, which is a continuation of application No. 07/351,287, filed on May 4, 1989, now abandoned, which is a continuation of application No. 06/810,531, filed on Dec. 17, 1985, now abandoned, which is a continuation of application No. 06/506,754, filed on Jun. 22, 1983, now abandoned, which is a continuation of application No. 06/141,897, filed on Apr. 21, 1980, now abandoned, which is a continuation-in-part of application No. 06/045,962, filed on Jun. 6, 1979, now abandoned. This application May 23, 1995, Appl. No. 448,014.

Claims priority, application Denmark, Apr. 20, 1979, 1645/79; Canada, Jun. 7, 1979, 329240; Denmark, Feb. 22, 1980, 791/80; Apr. 2, 1980, 1484/80

Int. Cl. C07K *16/24;16/00;* **C12P** *21/08;* **A61K** *38/21*

U.S. Cl. 530—413 **44 Claims**

1. A method for purifying human leukocyte interferon, comprising:

(a) treating an antibody that binds at least one species of human leukocyte interferon selected from the group consisting of a species having a molecular weight of 20,180±200 daltons, a species having a molecular weight of 19,500±200 daltons, a species having a molecular weight of 20,420±200 daltons, a species obtained from lymphoblastoid cells and having a molecular weight of 21,130±200 daltons and a species obtained from lymphoblastoid cells and having a molecular weight of 23,440± 200 daltons, molecular weights as determined under non-reducing SDS PAGE, to remove proteolytic activity;

(b) applying a solution of human leukocyte interferon to a matrix having immobilized thereon the treated antibody of (a); and

(c) eluting said human leukocyte interferon from the matrix.

US 6,410,698 B1

REACTIVE DYES WITH A COMBINATION ANCHOR

Frank Prechtl, Mannheim, and Manfred Patsch, Wachenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP99/01292, § 371 Date Sep. 7, 2000, § 102(e) Date Sep. 7, 2000, PCT Pub. No. WO99/47608, PCT Pub. Date Sep. 23, 1999

PCT Filed Feb. 27, 1999, Appl. No. 622,919

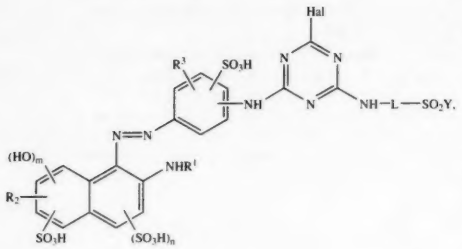
Claims priority, application Germany, Mar. 13, 1998, 198 10 906

Int. Cl. C09B *62/51;67/22;* D06P *1/384*

U.S. Cl. 534—638 11 Claims

1. A reactive dye of the general formula I

(I)



where

n is 0 or 1,

m is 0 or 1,

Y is vinyl or a radical of the formula C_2H_4Q, where Q is an alkali-detachable group,

L is C_2–C_6-alkylene with or without interruption by 1 or 2 nonadjacent oxygen atoms or 1 or 2 imino groups or is cyclohexylene,

Hal is fluorine or chlorine,

R^1 is hydrogen or hydroxysulfonylmethyl,

R^2 is hydrogen or hydroxysulfonylmethyl, and

R^3 is carboxyl or hydroxysulfonyl and may also be hydrogen when R^1 and/or R^2 are each hydroxysulfonylmethyl.

US 6,410,699 B1

PROCESS FOR THE PREPARATION OF ISOFLAVONE COMPOUNDS

Minoru Takebe, and Jitsuo Shiraishi, both of Tokyo-To, Japan, assignors to Nichimo Kabushiki Kaisha, Tokyo-To, Japan

PCT No. PCT/JP99/00057, § 371 Date Jul. 11, 2000, § 102(e) Date Jul. 11, 2000, PCT Pub. No. WO99/35138, PCT Pub. Date Jul. 15, 1999

PCT Filed Jan. 12, 1999, Appl. No. 600,045

Claims priority, application Japan, Jan. 12, 1998, 10-3941

Int. Cl. C07D *311/40;* C07H *17/07*

U.S. Cl. 536—8 5 Claims

1. A process for preparation of an isoflavone aglycone compound, comprising the steps of:

(1) removing fat from fermented soybeans to form a defatted material and drying the defatted material;

(2) subjecting the defatted material obtained in step (1) to extraction with a solvent to form an extract containing one or more isoflavone compounds and concentrating the extract to dryness;

(3) dissolving the extract from in step (2) in a second solvent to form a solution, diluting the solution with water, and separating insoluble matter that precipitates from the solution; and

(4) washing the insoluble matter obtained in step (3), and drying it to remove the second solvent, thereby obtaining one or more isoflavone aglycone compounds.

US 6,410,700 B1

GLYCAN DERIVATIVES

Keith Leslie Williams; Nicolle Hannah Packer; Andrew Arthur Gooley; John William Redmond, all of New South Wales; Steven Lewis Ramsay, Brompton, and Warren Charles Kett, New South Wales, all of Australia, assignors to Macquarie Research Ltd., New South Wales, Australia

PCT No. PCT/AU97/00676, § 371 Date Dec. 7, 1999, § 102(e) Date Dec. 7, 1999, PCT Pub. No. WO98/15566, PCT Pub. Date Apr. 16, 1998

PCT Filed Oct. 8, 1997, Appl. No. 284,302

Claims priority, application Australia, Oct. 8, 1996, P02840

Int. Cl. C07H *5/04;* C08B *37/00*

U.S. Cl. 536—18.7 21 Claims

1. A method for producing a glycan nitrone comprising reacting a glycan with a mono-N-substituted hydroxylamine at pH 6 or greater to form a glycan nitrone.

US 6,410,701 B1

HUMAN NEUROPEPTIDE RECEPTOR

Daniel R. Soppet, Centreville, Va.; Yi Li, Gaithersburg, and Craig A. Rosen, Laytonsville, both of Md., assignors to Human Genome Sciences, Inc., Rockville, Md.

Filed Jun. 5, 1995, Appl. No. 462,509

Claims priority, application WIPO, May 5, 1995, PCT/US95/05616

Int. Cl. C07H *21/02;21/04;* C12P *1/00;21/06*

U.S. Cl. 536—23.1 169 Claims

1. An isolated polynucleotide comprising a nucleic acid sequence selected from the group consisting of:

(a) a polynucleotide encoding amino acids 1–46 of SEQ ID NO:2;

(b) a polynucleotide encoding amino acids 47–72 of SEQ ID NO:2;

(c) a polynucleotide encoding amino acids 73–82 of SEQ ID NO:2;

(d) a polynucleotide encoding amino acids 83–106 of SEQ ID NO:2;

(e) a polynucleotide encoding amino acids 112–142 of SEQ ID NO:2;

(f) a polynucleotide encoding amino acids 163–189 of SEQ ID NO:2;

(g) a polynucleotide encoding amino acids 190–213 of SEQ ID NO:2;

(i) a polynucleotide encoding amino acids 335–363 of SEQ ID NO:2;

(j) a polynucleotide encoding amino acids 364–402 of SEQ ID NO:2; and

(k) a polynucleotide encoding amino acids 364–372 of SEQ ID NO:6.

US 6,410,702 B1

MODIFIED INTERNUCLEOSIDE LINKAGES (II)

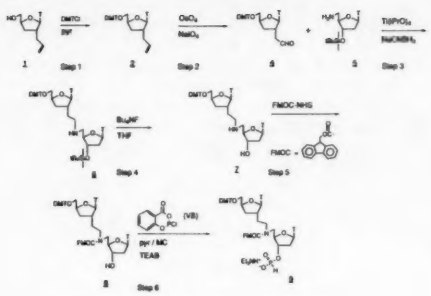
Sundaramoorthi Swaminathan; Mark Matteucci; Jeff Pudlo, all of Burlingame, and Robert J. Jones, Daly City, all of Calif., assignors to ISIS Pharmaceuticals, Inc., Carlsbad, Calif.

Division of application No. 07/892,902, filed on Jun. 1, 1992, now Pat. No. 5,817,781. This application Oct. 2, 1998, Appl. No. 165,883.

Int. Cl. C07H *21/02;21/04;19/00;* C12Q *1/68;* A01N *43/04*

U.S. Cl. 536—23.1 5 Claims

1. An oligonucleotide comprising a two, three or four atom



modified internucleoside linkage between the 2' and 5' position of adjacent nucleosides wherein the modified internucleoside linkage contains at least one carbon atom and at least one nitrogen, oxygen or sulfur atom, provided that no adjacent two or three atoms are all nitrogen, oxygen or sulfur, and wherein the oligonucleotide comprises a conjugate with a label, an intercalator, a drug or a lipophilic group.

US 6,410,703 B1

IDENTIFICATION OF A VACCINE CANDIDATE FROM AN EXTRAINTESTINAL ISOLATE OF *E. COLI*

Thomas Russo, Amherst, and Ulrike Carlino, Buffalo, both of N.Y., assignors to The Research Foundation of the State University of New York, Amherst, N.Y.

Provisional application No. 60/155,621, filed on Sep. 22, 1999. This application Sep. 22, 2000, Appl. No. 668,113.

Int. Cl. C07H *21/02;* **C12R** *21/06;21/04*

U.S. Cl. 536—23.1 **6 Claims**

1. An isolated polynucleotide consisting of a polynucleotide sequence selected from the group consisting of:

(a) a polynucleotide sequence encoding a polypeptide of SEQ ID NO:8; and

(b) a polynucleotide sequence which is complementary to the polynucleotide sequence of (a).

US 6,410,704 B1

METHODS AND COMPOSITIONS FOR THE PREPARATION AND USE OF A HERPES PROTEASE

Bernard Roizman, and Fenyong Liu, both of Chicago, Ill., assignors to Arch Development Corporation, Chicago, Ill.

Continuation of application No. 07/705,814, filed on May 24, 1991, now abandoned. This application Jan. 3, 1994, Appl. No. 176,320.

This patent is subject to a terminal disclaimer.

Int. Cl. C07H *21/04*

U.S. Cl. 536—23.2 **14 Claims**

1. An isolated and purified nucleic acid molecule comprising a fragment consisting of a sequence encoding a herpes simplex 1 protease, said molecule being engineered through the introduction of one or more genetic control elements to control the expression of said coding sequence, wherein said control element is one that does not normally control expression of the herpes virus protease in the herpes virus genome.

US 6,410,705 B1

NUCLEOTIDE SEQUENCES CODING FOR THE THRE GENE AND PROCESS FOR THE ENZYMATIC PRODUCTION OF L-THREONINE USING CORYNEFORM BACTERIA

Petra Ziegler, Aachen; Lothar Eggeling; Hermann Sahm, both of Jülich, and Georg Thierbach, Bielefeld, all of Germany, assignors to Degussa Huls Aktiengesellschaft, Hanau

Filed Nov. 1, 1999, Appl. No. 431,099

Claims priority, application Germany, Sep. 1, 1999, 199 41 478

Int. Cl. C07H *21/04;* **C12N** *15/74;1/20;9/10;* **C12P** *13/08*

U.S. Cl. 536—23.2 **11 Claims**

1. An isolated DNA molecule comprising a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of either SEQ ID NO:2 or SEQ ID NO:4.

US 6,410,706 B1

NUCLEIC ACID ENCODING CHITIN-BINDING RECEPTOR KINASE

Hyun-Sook Pai; Jang-Ryol Liu; Hye-Sun Cho, and Youn-Sung Kim, all of Taejon-si, Rep. of Korea, assignors to Korea Research Institute of Bioscience and Biotechnology, Rep. of Korea

Filed Feb. 14, 2000, Appl. No. 503,922

Claims priority, application Rep. of Korea, Feb. 12, 1999, 99-4938

Int. Cl. C12N *15/52;5/10;15/63*

U.S. Cl. 536—23.2 **9 Claims**

1. An isolated nucleic acid encoding a receptor kinase having the amino acid sequence of SEQ ID NO:1, said nucleic acid comprising the nucleotide sequence of SEQ ID NO:2.

US 6,410,707 B2

RECOMBINANT PREPARATION OF CALCITONIN FRAGMENTS AND USE THEREOF IN THE PREPARATION OF CALCITONIN AND RELATED ANALOGS

Fred W. Wagner, Walton; Jay S. Stout, Lincoln; Dennis B. Henriksen, Lincoln; Bruce E. Partridge, Lincoln; Bart Holmquist, Lincoln, and Julie A. Frank, Lincoln, all of Nebr., assignors to BioNebraska, Inc., Lincoln, Nebr.

Division of application No. 09/139,819, filed on Aug. 25, 1998, now Pat. No. 6,251,635, which is a division of application No. 08/595,868, filed on Feb. 6, 1996, now Pat. No. 5,962,270. This application Jan. 2, 2001, Appl. No. 750,913.

Int. Cl. C07H *21/04;* **C12N** *1/20;15/00;* **A61K** *38/00;* **C12P** *21/04*

U.S. Cl. 536—23.2 **2 Claims**

1. An isolated nucleic acid comprising a polynucleotide having the sequence of SEQ ID NO: 11.

US 6,410,708 B1

NUCLEIC ACIDS ENCODING A-33 RELATED ANTIGEN POLYPEPTIDES

Avi Ashkenazi, San Mateo; Sherman Fong, Alameda; Audrey Goddard, San Francisco; Austin L. Gurney, Belmont; Mary A. Napier, Hillsborough; Daniel Tumas, Orinda, and William I. Wood, Hillsborough, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

PCT No. PCT/US98/24855, § 371 Date Mar. 5, 1999, § 102(e) Date Mar. 5, 1999, PCT Pub. No. WO99/27098, PCT Pub. Date Jun. 3, 1999

Provisional application No. 60/078,936, filed on Mar. 20, 1998, Provisional application No. 60/066,364, filed on Nov. 21, 1997. This PCT application Nov. 20, 1998, Appl. No. 254,465.

Int. Cl. C07H *21/04;* C12N *15/09;15/12;15/63;15/85*

U.S. Cl. 536—23.5 8 Claims

1. An isolated nucleic acid molecule comprising:

(a) a nucleotide sequence encoding SEQ ID NO:2,

(b) a nucleotide sequence encoding amino acid 1 to amino acid X of SEQ ID NO:2, wherein X is any amino acid from 271 to 280, or

(c) the complement of (a) or (b).

US 6,410,709 B1

CORNICHON-LIKE PROTEIN

Steven M. Ruben, Olney; Craig A. Rosen, Laytonsville; Ping Fan, Gaithersburg; Hla Kyaw, Frederick, all of Md., and Ying-Fei Wei, Berkeley, Calif., assignors to Human Genome Sciences, Inc., Rockville, Md.

Continuation-in-part of application No. PCT/US98/17709, filed on Aug. 27, 1998, Provisional application No. 60/056,270, filed on Aug. 29, 1997, Provisional application No. 60/056,271, filed on Aug. 29, 1997, Provisional application No. 60/056,247, filed on Aug. 29, 1997, Provisional application No. 60/056,073, filed on Aug. 29, 1997. This application Feb. 25, 1999, Appl. No. 257,179.

Int. Cl. C07H *21/04*

U.S. Cl. 536—23.5 46 Claims

1. An isolated protein comprising amino acid residues 31 to 144 of SEQ ID NO:63.

US 6,410,710 B1

NUCLEIC ACID ENCODING A TRAF-3 DELETION ISOFORM

Seth Lederman, New York, and Winfried Van Eyndhoven, Bayside, both of N.Y., assignors to The Trustees of the University in the City of New York, New York, N.Y.

Filed Mar. 11, 1999, Appl. No. 268,544

Int. Cl. C07H *21/04;* C12N *15/11;15/63*

U.S. Cl. 536—23.5 4 Claims

1. An isolated nucleic acid molecule encoding a protein consisting of the amino acid sequence shown in FIG. **16** (SEQ ID NO:36).

US 6,410,711 B1

DNA ENCODING CD40 LIGAND, A CYTOKINE THAT BINDS CD40

Richard J. Armitage, Bainbridge Island; William C. Fanslow, Normandy Park; Melanie K. Spriggs, Seattle, all of Wash.; Subhashini Srinivasan, Greenbrae; Marylou G. Gibson, Carlsbad, both of Calif.; Arvia E. Morris, and Jeffrey T. McGrew, both of Seattle, Wash., assignors to Immunex Corporation, Seattle, Wash.

Continuation of application No. 08/477,733, filed on Jun. 7, 1995, now Pat. No. 5,981,724, which is a continuation-in-part of application No. 08/249,189, filed on May 24, 1994, now Pat. No. 5,961,974, which is a continuation-in-part of application No. 07/969,703, filed on Oct. 23, 1992, now abandoned, which is a continuation-in-part of application No. 07/805,723, filed on Dec. 5, 1991, now abandoned, which is a continuation-in-part of application No. 07/783,707, filed on Oct. 25, 1991, now abandoned. This application Sep. 20, 1999, Appl. No. 399,106. This patent is subject to a terminal disclaimer.

Int. Cl. C12N *15/19;15/12;15/00*

U.S. Cl. 536—23.5 68 Claims

1. An isolated polynucleotide, comprising a nucleic acid encoding a CD40L polypeptide that binds CD40, wherein said nucleic acid hybridizes to a polynucleotide selected from the group consisting of (a)–(f), or its complement, under moderately stringent conditions (prewashing solution of 5×SSC, 0.5% SDS, 1.0 mM EDTA, (pH 8.0) and hybridization conditions of 50° C., 5×SSC, overnight):

(a) a polynucleotide comprising nucleotides 46 through 828 of SEQ ID NO:11;

(b) a polynucleotide comprising nucleotides 184 through 828 of SEQ ID NO:11;

(c) a polynucleotide comprising nucleotides 196 through 828 of SEQ ID NO:11;

(d) a polynucleotide comprising nucleotides 403 through 828 of SEQ ID NO:11;

(e) a polynucleotide comprising nucleotides 382 through 828 of SEQ ID NO:11; and

(f) a polynucleotide comprising nucleotides 379 through 828 of SEQ ID NO:11.

US 6,410,712 B1

HUMAN NARCOLEPSY GENE

Berglind Ran Olafsdottir, Reykjavik, Iceland, and Jeffrey Gulcher, Chicago, Ill., assignors to deCODE genetics ehf., Reykjavik, Iceland

Filed Oct. 25, 1999, Appl. No. 426,290

Int. Cl. C07H *21/04;* C12N *15/11;15/63;15/85*

U.S. Cl. 536—23.5 3 Claims

1. An isolated nucleic acid molecule comprising the nucleic acid of SEQ ID NO: 1.

US 6,410,713 B1

DNA ENCODING PROTEINS THAT INHIBIT HSP70 FUNCTION

Vincent Guerriero, 1101 E. Paseo Pavon, Tucson, Ariz. 85718, and Deborah A. Raynes, 1971 W. Paseo Cuenca, Tucson, Ariz. 85704

Provisional application No. 60/109,351, filed on Nov. 20, 1998. This application Nov. 19, 1999, Appl. No. 444,336.

Int. Cl. C07H *21/04*

U.S. Cl. 536—23.5 17 Claims

1. An isolated and purified sequence of polynucleotides encoding a polypeptide as disclosed in any one of SEQ ID NO: 1, 2, 8 or 9, wherein said polypeptide binds a heat-shock protein and inhibits an ATPase activity of said heat-shock protein.

US 6,410,714 B1

CANINE LOW AFFINITY IGE RECEPTOR (CD23) NUCLEIC ACID MOLECULES AND USES THEREOF

Eric R. Weber, Fort Collins, and Catherine A. McCall, Boulder, both of Colo., assignors to Heska Corporation, Fort Collins, Colo.

Provisional application No. 60/125,913, filed on Mar. 24, 1999. This application Mar. 24, 2000, Appl. No. 535,521.

Int. Cl. C07H *21/04;* **C12N** *15/09;15/63*

U.S. Cl. 536—23.5 **11 Claims**

1. An isolated nucleic acid molecule selected from the group consisting of:

(a) an isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:4, SEQ ID NO:7, SEQ ID NO:10, SEQ ID NO:13, SEQ ID NO:16, SEQ ID NO:19 and SEQ ID NO:24; and

(b) an isolated nucleic acid molecule complementary to the isolated nucleic acid molecule of (a), wherein said complementary nucleic acid molecule comprises a nucleic acid sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:6, SEQ ID NO:9, SEQ ID NO:12, SEQ ID NO:15, SEQ ID NO:18, SEQ ID NO:21 and SEQ ID NO:26.

US 6,410,715 B1

METHODS FOR TREATING HORMONE DISORDERS

Nahum Sonenberg, Cote St. Luc, Canada; Arnim Pause, Rockville, Md.; Joe B. Harford, Redwood City, and Vincent J. Miles, San Ramon, both of Calif., assignors to Questcor Pharmaceuticals, Inc., Union City, Calif., and Mc Gill University, Montreal, Canada

Division of application No. 09/256,331, filed on Feb. 23, 1999, now Pat. No. 6,111,077, which is a division of application No. 08/294,143, filed on Aug. 22, 1994, now Pat. No. 5,874,231. This application Jun. 14, 2000, Appl. No. 593,483.

Int. Cl. C07H *21/04*

U.S. Cl. 536—23.5 **2 Claims**

1. A purified human nucleic acid sequence encoding a cellular component that binds to eIF-4E and causes a modulation of translation in a cell in response to a hormone comprising a coding sequence for the protein 4E-BP 1.

US 6,410,716 B1

ISOLATION OF SU1, A STARCH DEBRANCHING ENZYME, THE PRODUCT OF THE MAIZE GENE SUGARYL

Alan M. Myers, Ames, and Martha Graham James, Des Moines, both of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation-in-part of application No. 08/410,784, filed on Mar. 24, 1995, now Pat. No. 5,912,413. This application Feb. 24, 1999, Appl. No. 256,741.

This patent is subject to a terminal disclaimer.

Int. Cl. A01H *4/00;* **C12N** *15/29;15/00;15/82*

U.S. Cl. 536—23.6 **63 Claims**

1. A protein or polypeptide fragment thereof encoded by a nucleic acid isolate which hybridizes under stringent conditions to the complement of a nucleic acid sequence encoding the SU1 protein having the amino acid sequence of SEQ ID NO: 2.

US 6,410,717 B1

GENE ENCODING A HOST FACTOR PROTEIN INDISPENSABLE FOR MULTIPLICATION OF A PLANT VIRUS

Iwao Furusawa, Kyoto, and Masayuki Ishikawa, Sapporo, both of Japan, assignors to Kyoto University, Japan

Filed Oct. 19, 1999, Appl. No. 420,786

Claims priority, application Japan, Oct. 23, 1998, 10-301810; Aug. 19, 1999, 11-232678

Int. Cl. C07H *21/04;* **C12N** *5/10*

U.S. Cl. 536—23.6 **4 Claims**

1. An isolated DNA molecule consisting of:

a nucleotide sequence consisting of nucleotide numbers from 1 to 876 in SEQ ID NO.:2 or,

a nucleotide sequence that hybridizes with said nucleotide sequence of SEQ ID NO.:2 and encodes a protein having activity to induce the multiplication of an alpha-like virus in a host plant cell.

US 6,410,718 B1

MATERIALS AND METHODS FOR THE MODIFICATION OF PLANT LIGNIN CONTENT

Leonard N. Bloksberg, and Ilkka Havukkala, both of Remuera, New Zealand, assignors to Genesis Research & Development Corporation Ltd., and Fletcher Challenge Forests Ltd., both of New Zealand

Continuation-in-part of application No. 09/169,789, filed on Oct. 9, 1998, which is a continuation-in-part of application No. 08/975,316, filed on Nov. 21, 1997, now Pat. No. 5,952,486, which is a continuation-in-part of application No. 08/713,000, filed on Sep. 11, 1996, now Pat. No. 5,850,020, Provisional application No. 60/143,811, filed on Jul. 14, 1999. This application Jul. 12, 2000, Appl. No. 615,192.

Int. Cl. C07H *21/02;21/04;* **C12N** *15/82;15/00;15/09*

U.S. Cl. 536—23.6 **6 Claims**

1. An isolated polynucleotide comprising a nucleotide sequence selected from the group consisting of: (1) the sequence of SEQ ID NO: 266; (2) complements of the sequence of SEQ ID NO: 266; (3) reverse complements of the sequence of SEQ ID NO: 266; and (4)reverse sequences of the sequence of SEQ ID NO: 266.

US 6,410,719 B1

BLOOD GROUP ANTIGEN BINDING PROTEIN AND CORRESPONDING AGENTS

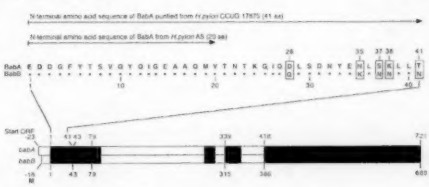
Thomas Boren, Törelvägen 68, S-906 28 Umeå; Anna Arnqvist, Umeå; Staffan Normark, Stockholm, and Dag Ilver, Umeå, all of Sweden, assignors to Thomas Boren, Umea, Sweden

Continuation of application No. PCT/SE97/01009, filed on Jun. 10, 1997, Provisional application No. 60/041,040, filed on Mar. 21, 1997. This application Feb. 10, 1998, Appl. No. 21,560.

Claims priority, application Sweden, Jun. 10, 1996, 9602287; Mar. 19, 1997, 9701014

Int. Cl. C07H *21/04*

U.S. Cl. 536—23.7 **4 Claims**



1. An isolated recombinant DNA from *Helicobacter pylori* encoding an adhesin protein, wherein said protein specifically binds to the fucosylated blood group antigens Lewis ^{b} and H-1, comprising the nucleotide acid sequence of SEQ ID NO:1.

US 6,410,720 B1

COMPOUNDS AND METHODS FOR TREATMENT AND DIAGNOSIS OF MYCOBACTERIAL INFECTIONS

Paul Tan, and Jun Hiyama, both of Auckland, New Zealand, assignors to Genesis Research & Development Corp. Ltd., New Zealand

Continuation of application No. 08/705,347, filed on Aug. 29, 1996. This application Nov. 5, 1998, Appl. No. 200,643. This patent is subject to a terminal disclaimer.

Int. Cl. C07H *21/04;* **A61K** *39/04;39/00;49/00;* **C12N** *1/12*

U.S. Cl. 536—23.7 **18 Claims**

1. An isolated polypeptide comprising an immunogenic portion of a soluble *M. vaccae* antigen, wherein said polypeptide is at least 80% pure and wherein said antigen induces an immune response in patients previously exposed to a mycobacteriuim.

US 6,410,721 B1

POLYNUCLEOTIDE DECOYS THAT INHIBIT MHC-II EXPRESSION AND USES THEREOF

C. Anthony Hunt; Carol Lim, both of San Francisco, and Marvin R. Garovoy, San Anselmo, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation of application No. 08/281,423, filed on Jul. 27, 1994, now Pat. No. 5,859,226, which is a continuation-in-part of application No. 08/100,088, filed on Jul. 29, 1993, now abandoned. This application Jan. 5, 1999, Appl. No. 225,645. This patent is subject to a terminal disclaimer.

Int. Cl. C07H *21/04*

U.S. Cl. 536—24.1 **16 Claims**

1. A polynucleotide decoy comprising:

(a) an internal oligonucleotide (I) having a length of X bases, where X is a number from about 14 to about 40;

(b) two cap oligonucleotides (P_1 and P_2), each having a length of from about 4 to about 8 bases, wherein each of said cap oligonucleotides is comprised of bases which are unable to bind to any other base within the same cap oligonucleotide;

(c) a first complementary oligonucleotide (C_1) having a length of Q bases, where Q is a number from about 5 to (X–5), said C_1 having a 3' to 5' nucleic acid sequence capable of Watson-Crick-type binding to the first Q bases in the 5' to 3' nucleic acid sequence of said I; and

(d) a second complementary oligonucleotide (C_2) having a length of Z bases, where Z is a number greater than equal to about 5 and from ((X–(Q+about X/8)) to (X–Q), said C_2 having a 5' to 3' nucleic acid sequence capable of Watson-Crick-type binding to the first Z bases in the 3' to 5' nucleic acid sequence of said I;

wherein the 3' end of said C_1 is covalently linked to the 5' end of said P_1, the 3' end of said P_1 is covalently linked to the 5' end of said I, the 3' end of said I is covalently linked to the 5' end of said P_2, and the 3' end of said P_2 is covalently linked to the 5' end of said C_2;

wherein at least one of the oligonucleotides selected from the group consisting of said C_1, said C_2, and said I, comprises at least one of the following sequences: (i) 5'Y*NYNRY*3' and (ii) 5'Y* NNNNAY3'

wherein:

N is any nucleotide;

R is a nucleotide comprising a purine, preferably an adenine or guanine deoxyribonucleotide;

Y is a nucleotide comprising a pyrimidine, preferably a cytosine or thymidine deoxyribonucleotide;

Y* is a nucleotide comprising a 5-methylated pyrimidine, preferably a 5-methyl cytosine or a thymidine deoxyribonucleotide;

A is a nucleotide comprising an adenine, preferably an adenine deoxyribonucleotide; and

wherein said polynucleotide decoy binds to an RF-X transcription factor.

US 6,410,722 B1

HUMAN AND MAMMALIAN DATA REPLICATION ORIGIN CONSENSUS SEQUENCES

Gerald B. Price, Montreal; Maria Zannis-Hadjopoulos, Westmount; Torsten O. Nielsen, British Columbia, and Nandini H. Cossons, Kingston, all of Canada, assignors to McGill University, Montreal, Canada

Continuation of application No. PCT/CA97/00972, filed on Dec. 12, 1997, Provisional application No. 60/047,322, filed on May 21, 1997, Provisional application No. 60/033,374, filed on Dec. 16, 1996. This application Jun. 9, 1999, Appl. No. 328,750.

Int. Cl. C07H *21/04*

U.S. Cl. 536—24.1 **2 Claims**

1. An isolated human or mammalian DNA replication origin sequence consisting essentially of a sequence selected from the group consisting of: SEQ ID NO:1, functional variants thereof having a sequence of at least 70% homology, and functional fragments thereof having at least 20 nucleotides, with the proviso that the isolated sequence does not comprise CCTCTAATGGCTTCCAAACATCACTTGGCAAATTCC (SEQ ID NO:15).

US 6,410,723 B1

VDUP1 PROMOTER AND METHODS OF USE THEREOF

Dale Ludwig, Rockaway, N.J., assignor to Imclone Systems Incorporated, New York, N.Y.

Filed Jul. 24, 2000, Appl. No. 625,040

Int. Cl. C07H *21/04;* **C12N** *5/00;5/02*

U.S. Cl. 536—24.1 **25 Claims**

1. A substantially purified nucleic acid molecule comprising a VDUP1 promoter region, whose expression is induced to maximal levels as a result of prolonged cell culture, having a sequence consisting of a nucleic acid sequence hybridizing under high stringency conditions to that of SEQ ID NO:1, which exhibits promoter activity.

US 6,410,724 B1

DIAGNOSTIC MEANS USEFUL FOR PREDICTIVE ASSESSMENT OF HUMAN HEPATOCELLULAR CARCINOMA DISEASE (HCC), AS WELL AS DIAGNOSTIC METHODS USING THE SAME

Anne Dejean, Paris; Marie-Annick Buendia, Le Perreux; Pascal Pineau, Paris, all of France; Hisaki Nagai, Kawasaki, Japan, and Pierre Tiollais, Paris, France, assignors to Institut Pasteur, and Institut National de la Sante et de la Recherche Medicale (Inserm), both of Paris, France

PCT No. PCT/IB98/00498, § 371 Date Jan. 21, 2000, § 102(e) Date Jan. 21, 2000, PCT Pub. No. WO98/45478, PCT Pub. Date Oct. 15, 1998

Provisional application No. 60/043,437, filed on Apr. 7, 1997. This PCT application Apr. 6, 1998, Appl. No. 402,453.

Int. Cl. C07H *21/04;* **C12Q** *1/68*

U.S. Cl. 536—24.3 **5 Claims**

1. A composition for the predictive diagnosis of an hepatocellular carcinoma in a patient consisting essentially of a first isolated polynucleotide primer or a pair of isolated polynucleotide primers capable of specifically detecting or amplifying a first microsatellite DNA marker and a second isolated polynucleotide primer or a pair of isolated polynucleotide primers capable of specifically detecting or amplifying a second microsatellite DNA marker, wherein:

said first microsatellite DNA marker is selected from the group consisting of D1S235, D1S238, D2S125, D2S336, D7S495, D8S263, D9S164, D9S273, and D17S928; and in that:

said second microsatellite DNA marker is selected from the group consisting of D1S199, D1S235, D1S238, D1S247, D1S255, D1S436, D1S478, D1S2644, D1S2828, D2S125, D2S336, D4S400, D4S426, D4S1564, D4S1572, D4S1616, D4S2937, D4S2945, D6S305, D7S493, D7S495, D8S262, D8S263, D8S264, D8S277, D8S518, D8S1469, D8S1721, D8S1731, D8S1742, D8S1752, D8S1819, D9S164, D9S273, D13S284, D14S81, D14S265, D14S280, D14S292, D14S995, D16S402, D16S422, D16S505, D16S511, D16S3098, D17S786 and D17S928; and

providing that said first and said second microsatellite DNA markers are not the same.

5. A composition for the predictive diagnosis of an hepatocellular carcinoma in a patient wherein said composition comprises:

a) an isolated polynucleotide primer or a pair of isolated polynucleotide primers capable of specifically detecting or amplifying the D14S81 microsatellite DNA marker;

b) an isolated polynucleotide primer or a pair of isolated polynucleotide primers capable of specifically detecting or amplifying a microsatellite DNA marker selected from the group consisting of D8S264, D8S262, D8S518, D8S1742, D8S277, D8S1819, D8S1721, D8S1731 and D8S1752;

c) an isolated polynucleotide primer or a pair of isolated polynucleotide primers capable of specifically detecting or amplifying a microsatellite DNA marker selected from the group consisting of D1S436, D1S2644, D1S199, D1S478, D1S2828, D1S247 and D1S255;

d) an isolated polynucleotide primer or a pair of isolated polynucleotide primers capable of specifically detecting or amplifying a microsatellite DNA marker selected from the group consisting of D16S3098, D16S505, D16S511, D16S422 and D16S402; and

e) an isolated polynucleotide primer or a pair of isolated polynucleotide primers capable of specifically detecting or amplifying a microsatellite DNA marker selected from the group consisting of D4S400, D4S1572, D4S1564, D4S2945, D4S1616 and D4S2937.

US 6,410,725 B1

METHOD FOR EXTRACTING DNA FROM DRIED SPECIMENS

Thomas Scholl, Salt Lake City; Michael T. Pyne, Midvale, both of Utah, and Arnold R Oliphant, Poway, Calif., assignors to Myriad Genetics Inc., Salt Lake City, Utah

Provisional application No. 60/122,113, filed on Feb. 26, 1999. This application Feb. 25, 2000, Appl. No. 513,179.

Int. Cl. C07H *21/04*

U.S. Cl. 536—25.42 **19 Claims**

1. A method for extracting DNA from a biological sample dried on a solid support which comprises:

(a) contacting the biological sample with a DNA extraction composition comprising:

(1) 5% to 90% formamide;

(2) 5 mM to 60 mM citrate; and

(3) 1 mM to 300 mM buffer, pH 6.0 to 8.8;

(b) incubating the mixture for 0.5 to 60 minutes at 4° to 60° C.;

(c) incubating the mixture for 0.5 to. 60 minutes at 45° to 100° C.; and

(d) isolating a supernatant containing extracted DNA.

US 6,410,726 B1

ARYLSULFONIC ACID SALTS OF PYRIMIDINE-BASED ANTIVIRAL

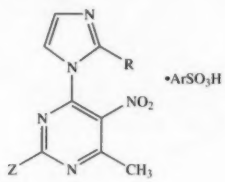
Jay P. Powers, Pacifica, Calif., assignor to Tularik Inc., So. San Francisco, Calif.

Provisional application No. 60/176,000, filed on Jan. 12, 2000. This application Jan. 8, 2001, Appl. No. 757,291.

Int. Cl. C07D *413/04;* **A61K** *31/535*

U.S. Cl. 544—122 **28 Claims**

1. A compound having the formula:



wherein

R is a member selected from the group consisting of hydrogen, methyl and ethyl;

Z is a substituted or unsubstituted 4-morpholinyl; and

Ar is a member selected from the group consisting of substituted or unsubstituted phenyl and substituted or unsubstituted naphthyl.

US 6,410,727 B1

METHOD FOR PURIFYING MELAMINE

Gerhard Coufal, Leonding, Austria, assignor to Agrolinz Melamin GmbH, Linz, Austria

PCT No. PCT/EP99/10008, § 371 Date Jun. 4, 2001, § 102(e) Date Jun. 4, 2001, PCT Pub. No. WO00/39107, PCT Pub. Date Jul. 6, 2000

PCT Filed Dec. 16, 1999, Appl. No. 857,414

Claims priority, application Austria, Dec. 23, 1998, 2166/98

Int. Cl. C07D *251/62*

U.S. Cl. 544—203 **8 Claims**

1. Method for purifying melamine, characterized in that impure melamine is brought into a temperature range T_T above 325° C. and lower than the melting point of melamine which depends on the respective prevailing ammonia pressure and is kept in this temperature range at an ammonia pressure of from 1 to 150 bar for the duration of from 1 minute to 20 hours, the melamine being present in this temperature range as a solid, after which, in any desired order, the pressure is relieved, cooling is effected and pure melamine is obtained in solid form.

US 6,410,728 B1

OXAZOLIDINONE CHEMOTHERAPEUTIC AGENTS

Richard J. Sciotti, Gurnee; Stevan W. Djuric, Libertyville, and Marina Pliushchev, Vernon Hills, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of application No. 09/652,504, filed on Aug. 31, 2000, now Pat. No. 6,277,868. This application Jun. 19, 2001, Appl. No. 884,735.

Int. Cl. C07D *487/02;413/10;277/68*

U.S. Cl. 544—256 **1 Claim**

1. A compound selected from:

N-(((5S)-3-(3-fluoro-4-(7H-purin-6-ylethynyl)phenyl)-2-oxo-1,3-oxazolidin-5-yl)methyl)acetamide,

N-(((5S)-3-(4-((5-(aminosulfonyl)thien-2-yl)ethynyl)-3-fluorophenyl)-2-oxo-1,3-oxazolidin-5-yl)methyl)acetamide,

N-(((5S)-3-(3-fluoro4-((1-oxo-2,3-dihydro-1H-inden-5-yl)ethynyl)phenyl)-2-oxo-1,3-oxazolidin-5-yl)methyl)acetamide,

5-((4-((5S)-5-((acetylamino)methyl)-2-oxo-1,3-oxazolidin-3-yl)-2-fluorophenyl)ethynyl)-2,3-dihydro-1-benzofuran-7-carboxylic acid,

N-(((5S)-3-(4-((1,3-dioxo-2,3-dihydro-1H-isoindol-5-yl)ethynyl)-3-fluorophenyl)-2-oxo-1,3-oxazolidin-5-yl)methyl)acetamide,

N-(((5S)-3-(4-((5-cyanopyridin-3-yl)ethynyl)-3-fluorophenyl)-2-oxo-1,3-oxazolidin-5-yl)methyl)acetamide,

N-(((5S)-3-(3-fluoro-4-(1,8-naphthyridin-2-ylethynyl)phenyl)-2-oxo-1,3-oxazolidin-5-yl)metyl)acetanide,

N-(((5S)-3-(3-fluoro-4-(1,8-naphthyridin-2-ylethynyl)phenyl)-2-oxo-1,3-oxazolidin-5-yl)methyl)acetamide,

N-(((5S)-3-(4-((2-aminopyrimidin-5-yl)ethynyl)-3-fluorophenyl)- 2-oxo-1,3-oxazolidin-5-yl)methyl)acetamide,

N-(((5S)-3-(3-fluoro-4-(pyrimidin-5-ylethynyl)phenyl)2-oxo-1,3-oxazolidin-5-yl)metbyl)acetamide, and

N-(((5S)-3-(3-fluoro-4-((2-oxo-2,3-dihydro- 1,3-benzothiazol-6-yl)ethynyl)phenyl)-2-oxo-1,3-oxazolidin-5-yl)methyl)acetamide.

US 6,410,729 B1

SUBSTITUTED PYRIMIDINE COMPOUNDS AND METHODS OF USE

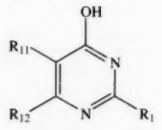
Ulrike D. Spohr; Michael J. Malone, both of Boulder, and Nathan B. Mantlo, Lafayette, all of Colo., assignors to Amgen Inc., Thousand Oaks, Calif.

Continuation of application No. 08/984,774, filed on Dec. 4, 1997, now abandoned, which is a continuation-in-part of application No. 08/976,054, filed on Nov. 21, 1997, now abandoned, Provisional application No. 60/032,128, filed on Dec. 5, 1996, Provisional application No. 60/050,950, filed on Jun. 13, 1997. This application Jun. 21, 2000, Appl. No. 598,740.

Int. Cl. C07D *239/02;239/12;239/22;* **A61K** *31/515*

U.S. Cl. 544—320 **31 Claims**

1. A compound of formula



or a pharmaceutically acceptable salt thereof, wherein

wherein R_1 is —Z—Y, provided that (1) the total number of aryl, heteroaryl, cycloalkyl and heterocyclyl radicals in each —Z—Y is 0–3;

wherein each Z is independently a

(1) bond;

(2) alkyl, alkenyl or alkynyl radical optionally substituted by (a) 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, hydroxy, alkoxy, alkylthio or halo, and (b) 1–2 radicals of heterocyclyl, aryl or heteroaryl optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, hydroxy, alkoxy, alkylthio, halo, alkyl or haloalkyl;

(3) heterocyclyl radical optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, hydroxy, alkoxy, alkylthio, alkyl or haloalkyl; or

(4) aryl or heteroaryl radical optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, hydroxy, alkoxy, alkylthio, cyano, halo, alkyl or haloalkyl;

each Y is independently a

(1) hydrogen radical;

(2) halo or nitro radical;

(3) $—C(O)—R_{20}$ or $—C(NR_5)—NR_5R_{21}$ radical;

(4) $—OR_{21}$, $—O—C(O)—R_{21}$, $—O—C(O)—NR_5R_{21}$ or $—O—C(O)—NR_{22}—S(O)_2—R_{20}$ radical;

(5) $—SR_{21}$, $—S(O)—R_{20}$, $—S(O)_2—R_{20}$, $—S(O)_2—NR_5R_{21}$, $—S(O)_2—NR_{22}—C(O)—R_{21}$, $—S(O)_2—NR_{22}—C(O)—OR_{20}$ or $—S(O)_2—NR_{22}—C(O)—NR_5R_{21}$ radical; or

(6) $—NR_5R_{21}$, $—NR_{22}—C(O)—R_{21}$, $—NR_{22}—C(O)—OR_{20}$, $—NR_{22}—C(O)—NR_5R_{21}$, $—NR_{22}—C(NR_5)—NR_5R_{21}$, $—NR_{22}—S(O)_2—R_{20}$ or $—NR_{22}—S(O)_2—NR_5R_{21}$ radical;

wherein each R_5 is independently

(1) hydrogen radicals;

(2) alkyl, alkenyl or alkynyl radicals optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, hydroxy, alkoxy, alkylthio, $—SO_3H$ or halo; or

(3) aryl, heteroaryl, aralkyl, heteroaralkyl, heterocyclyl, heterocyclylalkyl, cycloalkyl or cycloalkylalkyl radicals optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, hydroxy, alkoxy, alkylthio, alkyl or haloalkyl; and

wherein each R_{20} is independently

(1) alkyl, alkenyl or alkynyl radicals optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, N-(alkoxycarbonyl)-N-(alkyl)amino, aminocarbonylamino, alkylsulfonylamino, hydroxy, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, halo or aralkoxy, aralkylthio, aralkylsulfonyl, cycloalkyl, heterocyclyl, aryl or heteroaryl radicals optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, alkanoyl, hydroxy, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, halo, alkyl or haloalkyl;

(2) heterocyclyl radical optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, hydroxy, alkoxy, alkylthio, alkyl or haloalkyl; or

(3) aryl or heteroaryl radicals optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, alkoxycarbonyl, hydroxy, alkoxy, alkylthio, cyano, halo, azido, alkyl or haloalkyl;

each R_{21} is independently hydrogen radical or R_{20};

each R_{22} is independently

(1) hydrogen radical;

(2) alkyl radical optionally substituted by a radical of heterocyclyl, aryl or heteroaryl optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, hydroxy, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, cyano, halo, alkyl or haloalkyl; or

(3) heterocyclyl, aryl or heteroaryl radicals optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, hydroxy, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, cyano, halo, alkyl or haloalkyl; provided when Z is a bond and Y is $—NR_{22}—C(O)—NH_2$, then R_{22} is other then an optionally substituted aryl radical; and

R_{11} and R_{12} are each independently an aryl or heteroaryl radical optionally substituted by 1–3 radicals of

(1) R_{30};

(2) halo or cyano radicals;

(3) $—C(O)—R_{30}$, $—C(O)—OR_{29}$, $—C(O)—NR_{31}R_{32}$ or $—C(NR_{31})—NR_{31}R_{32}$ radicals;

(4) $—OR_{29}$, $—O—C(O)—R_{29}$, $—O—C(O)—NR_{31}R_{32}$ or $—O—C(O)—NR_{33}—S(O)_2—R_{30}$ radicals;

(5) $—SR_{29}$, $—S(O)—R_{30}$, $—S(O)_2R_{30}$, $—S(O)_2—NR_{31}R_{32}$, $—S(O)_2NR_{33}—C(O)—R_{30}$, $—S(O)_2—NR_{33}—C(O)—OR_{30}$ or $—S(O)_2—NR_{33}—C(O)—NR_{31}R_{32}$ radicals; or

(6) $—NR_{31}R_{32}$, $—NR_{33}—C(O)—R_{29}$, $—NR_{33}—C(O)—OR_{30}$, $—NR_{33}—C(O)—NR_{31}R_{32}$, $—NR_{33}—C(NR_{31})—NR_{31}R_{32}$, $—NR_{33}—S(O)_2—R_{30}$ or $—NR_{33}—S(O)_2—NR_{31}R_{32}$ radicals;

provided that (1) R_{11} is other than a 4-pyridyl, 4-pyrimidinyl, 4-quinolyl or 6-isoquinolinyl radical optionally substituted by 1–2 substituents; and (2) the total number of aryl, heteroaryl, cycloalkyl and heterocyclyl radicals substituted on each of R_{11} and R_{12} is 0–1;

wherein each R_{30} is independently

(1) alkyl, alkenyl or alkynyl radicals optionally substituted by 1–3 radicals of —$NR_{31}R_{31}$, —CO_2R_{23}, hydroxy, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, cyano, halo or aralkoxy, aralkylthio, aralkylsulfonyl, heterocyclyl, aryl or heteroaryl radicals optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, hydroxy, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, cyano, halo, alkyl or haloalkyl;

(2) heterocyclyl radical optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, hydroxy, alkoxy, alkylthio, cyano, alkyl or haloalkyl; or

(3) aryl or heteroaryl radicals optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, hydroxy, alkoxy, alkylthio, cyano, halo, alkyl or haloalkyl;

each R_{29} is independently hydrogen radical or R_{30};

each R_{31} and R_{32} are each independently

(1) hydrogen radicals;

(2) alkyl radical optionally substituted by an cycloalkyl, aryl, heterocyclyl or heteroaryl radical optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, hydroxy, alkoxy, alkylthio, cyano, alkyl or haloalkyl; or

(3) aryl, heteroaryl, heterocyclyl or cycloalkyl radical optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, hydroxy, alkoxy, alkylthio, cyano, alkyl or haloalkyl; and

wherein each R_{33} is independently

(1) hydrogen radical; or

(2) alkyl radical optionally substituted by a radical of heterocyclyl, aryl or heteroaryl optionally substituted by 1–3 radicals of amino, alkylamino, dialkylamino, alkanoylamino, alkoxycarbonylamino, alkylsulfonylamino, hydroxy, alkoxy, alkylthio, cyano, alkyl or haloalkyl; and

provided that (1) when R^1 and R^{12} are the same and are a 5- or 6-member ring having from 1–3 heteroatoms independently selected from N, S, and O, to which ring a benzene ring is optionally fused, then R^{11} is other than phenyl or naphthyl optionally substituted with halo, C_1–C_6 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthiol, hydroxy, amino, C_1–C_4 alkylamino, or dialkylamino, and R^{11} is other than a 5- or 6-membered ring having from 1–3 heteroatoms independently selected from N, S, and O, to which ring a benzene ring is optionally fused and optionally substituted with C_1–C_6 alkyl; (2) when R^{11} and R^{12} are each an optionally substituted phenyl radical, then R^1 is other than an optionally substituted 2-pyridyl radical; and (3) when R^{11} is an unsubstituted phenyl radical, then R^{12} is other than an unsubstituted phenyl radical.

US 6,410,730 B2

PROCESS FOR PREPARATION OF SULFONYLUREA SALTS

Andrea Rolf Sting, Gipf-Oberfrick, Switzerland, assignor to Syngenta Crop Protection, Inc., Greensboro, N.C.

Division of application No. 09/139,996, filed on Aug. 25, 1998, now Pat. No. 6,222,037. This application Feb. 9, 2001, Appl. No. 780,870.

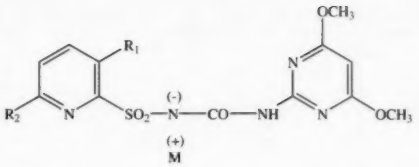
Claims priority, application Switzerland, Sep. 5, 1997, 2084/97

Int. Cl. C07D *239/42;213/02*

U.S. Cl. 544—320 **5 Claims**

1. A process for the preparation of a compound of formula I

(I)



M

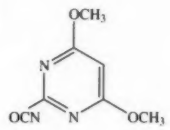
wherein R_1 is selected from the group consisting of —CO_2CH_3, —$CON(CH_3)_2$, —OCH_2CF_3, —$N(CH_3)COCH_3$, —$N(CH_3)SO_2CH_3$, —CF_3, and —$SO_2C_2H_5$;

R_2 is selected from the group consisting of hydrogen and —CF_3; and

M is selected from the group consisting of sodium and potassium; comprising:

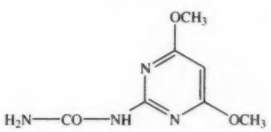
reacting a compound of formula IV

(IV)



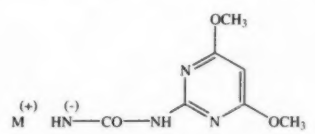
in an aprotic, organic solvent with NH_3 to form a compound of formula III

(III)



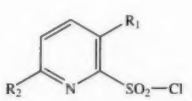
which compound III is further reacted in an aprotic, organic solvent with an alkali metal compound selected from the group consisting of a hydride, hydroxide, alcoholate, hydrogen carbonate, and carbonate salt of M to form a compound of formula II

(II)



wherein M is as defined above; which compound of formula II is further reacted with a compound of formula VI

(VI)



wherein R_1 and R_2 are as defined above.

US 6,410,731 B2
CAMPTOTHECIN ANALOGS AND METHODS OF PREPARATION THEREOF

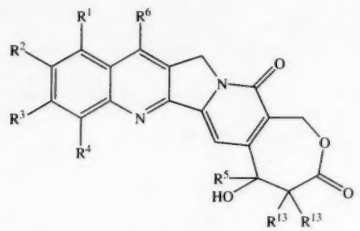
Dennis P. Curran; Bom David, both of Pittsburgh, Pa., and Thomas G. Burke, Lexington, Ky., assignors to University of Pittsburgh, Pittsburgh, Pa., and University of Kentucky Research Foundation, Lexington, Ky.

Continuation of application No. 09/290,019, filed on Apr. 9, 1999, now Pat. No. 6,207,832. This application Nov. 30, 2000, Appl. No. 728,031.

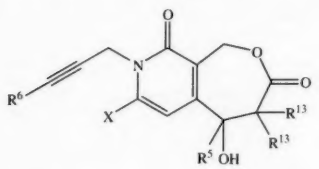
Int. Cl. C07D *491/22;491/14*

U.S. Cl. 546—41 **9 Claims**

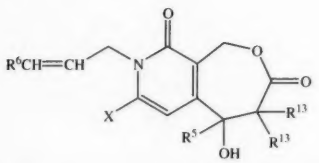
1. A method of synthesizing a compound having the formula



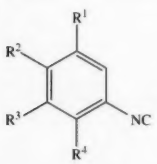
via a cascade radical 4+1 annulation wherein the precursor



or the precursor



is reacted with an arylisonitrile having the formula



wherein X is a radical precursor;

wherein R^1 and R^2 are independently the same or different and are hydrogen, —C(O)R^f wherein R^f is an alkyl group, an alkoxy group, an amino group or a hydroxy group, an alkyl group, an alkenyl group, an alkynyl group, an alkoxy group, an aryloxy group, an acyloxy group, —OC(O)OR^d, wherein R^d is an alkyl group, —OC(O)N^aR^b wherein R^a and R^b are independently the same or different, H, —C(O)R^f, an alkyl group or an aryl group, a halogen, a hydroxy group, a nitro group, a cyano group, an azido group, a formyl group, a hydrazino group, an amino group, —SR^c, wherein R^c is hydrogen, —C(O)R^f, an alkyl group or an aryl group; or R^1 and R^2 together form a chain of three or four members selected from the group of CH, CH_2, O, S, NH, or NR^{15}, wherein R^{15} is an C_1–C_6 alkyl group;

R^3 is H, a halogen atom, a nitro group, an amino group, a hydroxy group, or a cyano group; or R^2 and R^3 together form a chain of three or four members selected from the group of CH, CH_2, O, S, NH, or NR^{15};

R^4 is H, F, an amino group, a C_{1-3} alkyl group, a C_{2-3} alkenyl group, a C_{2-3} alkynyl group, a trialkylsilyl group or a C_{1-3} alkoxy group;

R^5 is a C_{1-10} alkyl group, an alkenyl group, an alkynyl group, or a benzyl group;

R^{13} is H, F or —CH_3; and

R^6 is H, an alkyl group, —$Si(R^8R^9R^{10})$ or —$(R^7)Si(R^8R^9R^{10})$, wherein R^7 is an alkylene group, an alkenylene group, or an alkynylene group; and R^8, R^9 and R^{10} are independently a C_{1-10} alkyl group, a C_{2-10} alkenyl group, a C_{2-10} alkynyl group, an aryl group or a —$(CH_2)_NR^{11}$ group, wherein N is an integer within the range of 1 through 10 and R^{11} is a hydroxy group, an alkoxy group, an amino group, an alkylamino group, a dialkylamino group, a halogen atom, a cyano group, —SR^c or a nitro group.

US 6,410,732 B2
PROCESSING AND SYNTHETIC INTERMEDIATES FOR PREPARING N-ARYLACRIDANCARBOXYLIC ACID DERIVATIVES

Hashem Akhavan-Tafti, Howell; Robert A. Eickholt, Troy, and Richard S. Handley, Canton, all of Mich., assignors to Lumigen, Inc., Southfield, Mich.

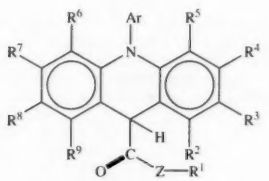
Continuation-in-part of application No. 09/557,726, filed on Apr. 26, 2000, now Pat. No. 6,296,787, which is a continuation of application No. 09/358,002, filed on Jul. 21, 1999, now Pat. No. 6,090,571, which is a division of application No. 08/894,143, filed on Aug. 13, 1997, now Pat. No. 6,045,727, which is a continuation-in-part of application No. 08/585,090, filed on Jan. 16, 1996, now abandoned, and a continuation-in-part of application No. 08/683,927, filed on Jul. 19, 1996, now abandoned. This application Jan. 25, 2001, Appl. No. 770,015.

Int. Cl. C07D *219/02;401/04*

U.S. Cl. 546—102 **50 Claims**

1. A process for preparing an N-arylacridancarboxylic acid derivative of the formula (1):

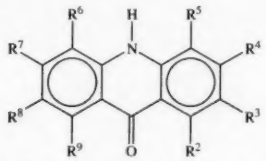
(1)



wherein R^1 is selected from alkyl, substituted alkyl, heteroalkl, aralkyl, substituted aralkyl, aryl, substituted aryl and heteroaryl groups, Z is selected from O and S atoms or the group ZR^1 is an —$NR^{10}R^{11}$ group wherein R^{10} and R^{11} are independently selected from alkyl, substituted alkyl, aryl, substituted aryl, aralkyl, alkylsulfonyl and arylsulfonyl groups, and wherein R^{10} and R^{11} can be combined with N into a heterocycle with leaving group ability, each of R^2–R^9 is independently selected from substituents which contain from 1 to 50 atoms selected from C, H, N, O, S, P and halogen atoms and wherein Ar is selected from aryl, substituted aryl and heteroaryl groups, the process comprising the steps of:

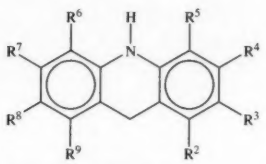
a) reducing an acridone compound (2) having the formula:

(2)



wherein R^2–R^9 are as defined above to an acridan compound (3) having the formula:

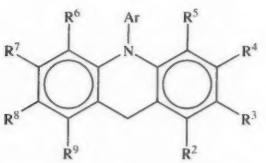
(3)



wherein R^2–R^9 are as defined above;

b) converting the acridan compound (3) to an N-arylacridan compound (4) having the formula:

(4)



wherein R^2–R^9 are as defined above and Ar is an aryl, substituted aryl or heteroaryl ring group by reacting the acridan compound with an arylating compound selected from aryl, substituted aryl and heteroaryl halides and aryl, substituted aryl and heteroaryl sulfonate esters in an inert solvent in the presence of a base and a palladium catalyst; and

c) converting the N-arylacridan (4) to the N-arylacridancarboxylic acid derivative by a carboxylation reaction in which a carbonyl-containing group is attached to the 9-position of the acridan ring.

US 6,410,733 B1

AMIDINE INHIBITORS OF SERINE PROTEASES

Richard M. Pastor, San Francisco; Dean R. Artis, Kensington, and Alan G. Olivero, Half Moon Bay, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

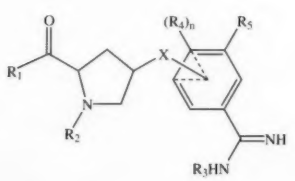
Provisional application No. 60/231,679, filed on Sep. 11, 2000. This application Sep. 5, 2001, Appl. No. 947,424.

Int. Cl. C07D *215/14;207/09;* **A61K** *31/47;31/40*

U.S. Cl. 546—168 **20 Claims**

1. A compound of formula (I)

(I)



wherein

X is O, $CR_6R_{6'}$, NR_6 or S, wherein R_6 and $R_{6'}$ are independently H or alkyl;

R_1 is H, —OR_7, an amino acid or —$NR_7R_{7'}$, wherein R_7 and $R_{7'}$ are independently H or a hydrocarbon chain, a carbocycle, a heterocycle, a carbocycle-substituted hydrocarbon chain or a heterocycle-substituted hydrocarbon chain optionally substituted with hydroxyl, halogen, cyano, amino, nitro, amidine, guanidine alkyl, halo-substituted alkyl, alkoxy, aryl or carboxyl; or R_7 and $R_{7'}$ together form a heterocyle optionally fused to another heterocycle or carbocycle wherein said heterocycle and carbocycle are optionally substituted with hydroxyl, halogen, amino, nitro, amidine, guanidine, alkyl, halo-substituted alkyl, alkoxy or carboxyl;

R_2 is H or a hydrocarbon chain, a carbocycle or a carbocycle-substituted hydrocarbon chain optionally substituted with hydroxyl, oxo, halogen, cyano, amino, nitro, amidine, guanidine, alkyl, halo-substituted alkyl, alkoxy or carboxyl; and wherein said hydrocarbon chain is optionally interrupted with N, O, S, SO or SO_2;

R_3 is H or a protecting group;

R_4 is selected from the group consisting of H, hydroxyl, halogen, amino, nitro, amidine, guanidine and acylamino;

R_5 is H or R_4 and R_5 together form a 5 or 6 member carbocycle or heterocycle ring optionally substituted with hydroxyl, halogen, amino, nitro, amidine, guanidine or acylamino;

n is 0 or 1; or a salt, a solrate or a hydrate thereof.

US 6,410,734 B1

2-SUBSTITUTED THIAZOLIDINONES AS BETA-3 ADRENERGIC RECEPTOR AGONISTS

Baihua Hu, Nanuet, N.Y., assignor to Wyeth, Madison, N.J.

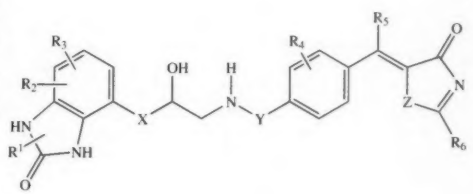
Provisional application No. 60/218,724, filed on Jul. 17, 2000. This application Jul. 12, 2001, Appl. No. 904,157.

Int. Cl. C07D *417/00;277/08;* **A61K** *31/426;31/445*

U.S. Cl. 546—207 **4 Claims**

1. A compound of formula I having the structure:

I



wherein:

X is —OCH_2—, —SCH_2—, or a bond;

Y is alkyl of 1–6 carbon atoms, alkyloxy of 1–6 carbon atoms, azetidine, pyrrolidine or piperidine; wherein the nitrogen of the azetidine, pyrrolidine or piperidine attached to the adjacent phenyl ring;

R_1, R_2, and R_3 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, cycloalkyl of 3–8 carbon atoms, hydroxy, halogen, trifluoromethyl, alkoxy of 1–6 carbon atoms, benzyloxy, allyloxy, propargyloxy, acyloxy of 2–7 carbon atoms, cyano, nitro, amino, aminocarbonyl, alkylamino of 1–6 carbon atoms, dialkylamino of 1–6 carbon atoms per alkyl group, formamido, ureido, acylamino of 2–7 carbon atoms, alkylsulfonylamino of 1–6 carbon atoms, arylsulfonylamino, dialkyloxyphosphorylamino of 1–6 carbon atoms per alkyl group, or dihydroxyphosphorylamino, or two of the three substituents (R_1, R_2 and R_3) combine with the carbon to which each is attached to form an aryl fused cycloalkyl of 3–8 carbon atoms, the aryl fused cycloalkyl group being unsubstituted or substituted with acylamino or hydroxy;

R_4 is hydrogen, alkyl of 1–6 carbon atoms, alkoxy of 1–6 carbon atoms, hydroxy, carboxy, or halogen;

R_5 is hydrogen or alkyl of 1–6 carbon atoms;

R_6 is (i) SCH_3 or NR_7R_8; (ii) an amino acid, wherein the nitrogen of amino acid is attached to the adjacent thiazolidinone, oxazolidinone, or imidazolidinone ring; (iii) an alkyl ester of an amino acid, wherein the nitrogen of amino acid is attached to the adjacent thiazolidinone, oxazolidinone, or imidazolidinone ring, and the alkyl moiety of the alkyl ester contains 1–6 carbon atoms; or (iv) $NH(C{=}Q)NR_7R_8$ or $NHNH(C{=}Q)NR_7R_8$;

R_7 and R_8 are each, independently, hydrogen, aryl, Het, alkyl of 1–6 carbon atoms, arylalkyl in which the alkyl moiety has 1–6 carbon atoms, Hetalkyl in which the alkyl moiety has 1–6 carbon atoms, haloalkyl of 1–6 carbon atoms, dialkylaminoalkyl of 1–6 carbon atoms per alkyl group, hydroxy, alkoxy of 1–6 carbon atoms, benzyloxy, cyano, alkylamino of 1–6 carbon atoms, dialkylamino having 1–6 carbon atoms per alkyl group, acylamino of 2–7 carbon atoms, alkylsulfonylamino of 1–6 carbon atoms; or R_7 and R_8 are taken together with the nitrogen to which each is attached to form a saturated, unsaturated, or partially unsaturated 3–8 membered heterocyclic ring containing 0 to 3 additional heteroatoms selected from S, O and N, the ring being unsubstituted or substituted with R_9;

Q is O, S, NH, NCN; or Q and one of R_7 and R_8 are taken together to form a partially unsaturated or unsaturated 3–8 membered heterocyclic ring optionally containing 1–2 additional heteroatoms selected from S, O, and N, the ring being unsubstituted or substituted with R_9;

Het is a monocyclic or bicyclic heterocycle of 5–10 ring atoms, having 1–4 heteroatoms selected from oxygen, nitrogen, and sulfur; wherein the heterocycle may be saturated, unsaturated, or partially unsaturated; un-fused or fused to a phenyl ring, and unsubstituted or substituted with R_9;

R_9 is alkyl of 1–6 carbon atoms, cycloalkyl of 3–8 carbon atoms, arylalkyl having 1–6 carbon atoms in the alkyl group, hydroxy, halogen, trifluoromethyl, alkoxy of 1–6 carbon atoms, benzyloxy, allyloxy, propargyloxy, acyloxy of 2–7 carbon atoms, cyano, nitro, amino, aminocarbonyl, alkylamino of 1–6 carbon atoms, dialkylamino of 1–6 carbon atoms per alkyl group, formamido, ureido, acylamino of 2–7 carbon atoms, alkylsulfonylamino of 1–6 carbon atoms, arylsulfonylamino, dialkyloxyphosphorylamino of 1–6 carbon atoms per alkyl group, or dihydroxyphosphorylamino;

or a pharmaceutically acceptable salt thereof.

US 6,410,735 B1

1-(4-ARYLPIPERAZIN-1-Y1)-ω-[N-(α,ω-DICARBOXIMIDO)]-ALKANES USEFUL AS UROSELECTIVE α_1-ADRENOCEPTOR BLOCKERS

Nitya Anand, Lucknow; Neelima Sinha; Sanjay Jain, both of Noida; Anita Mehta, Gurgaon, and Anil Kumar Saxena, Lucknow, all of India, assignors to Ranbaxy Laboratories Limited, New Delhi, India

Division of application No. 09/120,265, filed on Jul. 21, 1998, now Pat. No. 6,083,950. This application May 24, 2000, Appl. No. 578,088.

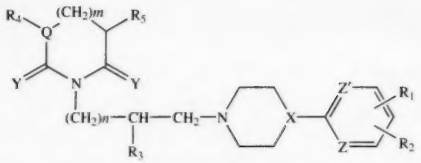
Claims priority, application India, Nov. 13, 1997, 3261/Del/97; Nov. 13, 1997, 3260/Del/97

Int. Cl. C07D *401/14;403/06;403/14*

U.S. Cl. 546—208 **2 Claims**

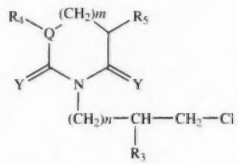
1. A method for making a compound having the structure of Formula I

(I)



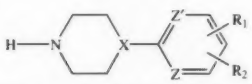
its pharmaceutically acceptable salts, esters, enantiomers, diastereomers, or N oxides, wherein Y is O or S; Q, X, Z and Z' are independently CH or N; m=0–3; n=0–4; R_1, R_2 are independently selected from: H, F, Cl, Br, OCH_3, OC_2H_5, OCH_2CF_3, SCF_3, CH_3, C_2H_5, CF_3, isopropyloxy, and cyclopropyl; R_3 is H, R_6, OH or OR_6; R_6 is a substituted or unsubstituted alkyl chain containing 1–6 carbon atoms; and R_4, R_5 are H, $C_{1\text{-}3}$ alkyl, substituted or unsubstituted phenyl, or a 5-membered spiro ring, which comprises reacting a compound having the structure of Formula VII'

(VII')



with a compound having the structure of Formula VII in the presence of a base and dimethylformamide solvent at a temperature from about 60–80° C. for about 10–18 hours

(VIII)



thereby to produce the compound of Formula I.

US 6,410,736 B1

BIARYL ETHER DERIVATIVES USEFUL AS MONOAMINE REUPTAKE INHIBITORS

Harry R. Howard, Jr., Bristol, and Mavis D. Adam, East Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

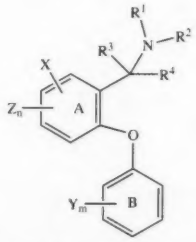
Continuation of application No. PCT/IB00/01373, filed on Sep. 25, 2000, Provisional application No. 60/167,761, filed on Nov. 29, 1999. This application Oct. 19, 2000, Appl. No. 692,335.

Int. Cl. C07D *211/76;307/34*

U.S. Cl. 546—216 **7 Claims**

1. A compound of the formula

I



wherein phenyl ring A and phenyl ring B can each, independently, be replaced by a naphthyl group, and wherein when phenyl ring A

is replaced by a naphthyl group, the ethereal oxygen of structure I and the carbon to which R^3, R^4 and NR^1R^2 are attached, are attached to adjacent ring carbon atoms of the naphthyl group and neither of said adjacent ring carbon atoms is also adjacent to a fused ring carbon atom of said naphthyl group;

n and m are, selected, independently, from one, two and three;

R^1 and R^2 are selected, independently, from hydrogen, $(C_1–C_4)$alkyl, $(C_2–C_4)$alkenyl, and $(C_2–C_4)$alkynyl, or R^1 and R^2, together with the nitrogen to which they are attached, form a four to eight membered saturated ring containing one or two heteroatoms, including the nitrogen to which R^1 and R^2 are attached, wherein the second heteroatom, when present, is selected from oxygen, nitrogen and sulfur, and wherein said ring may optionally be substituted at available binding sites with from one to three substituents selected, independently, from hydroxy and $(C_1–C_6)$alkyl;

R^3 and R^4 are selected, independently, from hydrogen and $(C_1–C_4)$ alkyl optionally substituted with from one to three fluorine atoms, or R^3 and R^4 together with the carbon to which they are attached, form a four to eight membered saturated carbocyclic ring, and wherein said ring may optionally be substituted at available binding sites with from one to three substituents selected, independently, from hydroxy and $(C_1–C_6)$alkyl;

or R^2 and R^3, together with the nitrogen to which R^2 is attached and the carbon to which R^3 is attached, form a four to eight membered saturated ring containing one or two heteroatoms, including the nitrogen to which R^2 is attached, wherein the second heteroatom, when present, is selected from oxygen, nitrogen and sulfur, and wherein said ring may optionally be substituted at available binding sites with from one to three substituents selected, independently, from hydroxy and $(C_1–C_6)$alkyl;

each X is selected, independently, from phenyl, heteroaryl and heterocycle, and wherein each X may be further substituted by hydrogen, halo, $(C_1–C_4)$alkyl optionally substituted with from one to three fluorine atoms, $(C_1–C_4)$alkoxy optionally substituted with from one to three fluorine atoms, cyano, nitro, amino, hydroxy, carbonyl, $(C_1–C_4)$alkylamino, di-[$(C_1–C_4)$alkyl]amino, $NR^5(C{=}O)(C_1–C_4)$alkyl, $SO_2NR^5R^6$ and $SO_p(C_1–C_6)$alkyl, wherein R^5 and R^6 are selected, independently, from hydrogen and $(C_1–C_6)$alkyl, and p is zero, one or two;

each Y is selected, independently, from hydrogen, halo, $(C_1–C_4)$alkyl optionally substituted with from one to three fluorine atoms, $(C_1–C_4)$alkoxy optionally substituted with from one to three fluorine atoms, cyano, nitro, amino, $(C_1–C_4)$alkylamino, di-[$(C_1–C_4)$alkyl]amino, $NR^5(C{=}O)(C_1–C_4)$alkyl, $SO_2NR^5R^6$ and $SO_p(C_1–C_6)$alkyl, wherein R^5 and R^6 are selected, independently, from hydrogen and $(C_1–C_6)$alkyl, and p is zero, one or two; and

each Z is selected independently from hydrogen, halo, $(C_1–C_4)$alkyl optionally substituted with from one to three fluorine atoms, $(C_1–C_4)$alkoxy;

or a pharmaceutically acceptable salt thereof.

US 6,410,737 B1
PROCESSES FOR PREPARING PESTICIDAL INTERMEDIATES

Jean-Erick Ancel, Saint-Genis-Laval; Gilles Perrin-Janet, Chaponnay; Manuel Vangelisti, Lyons, and Pierre Versproumy, Villeurbanne, all of France, assignors to Aventis CropScience, S.A., Lyons, France

PCT No. PCT/EP00/03103, § 371 Date Jan. 4, 2002, § 102(e) Date Jan. 4, 2002, PCT Pub. No. WO00/59862, PCT Pub. Date Oct. 12, 2000

PCT Filed Mar. 30, 2000, Appl. No. 937,816

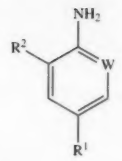
Claims priority, application United Kingdom, Mar. 31, 1999, 9907458

Int. Cl. C07C *211/28;* **C07D** *213/02*

U.S. Cl. 546—311 **16 Claims**

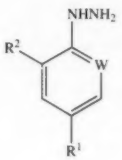
1. A process for preparing a compound of formula (I):

(I)



wherein R is haloalkyl, haloalkoxy or $–SF_5$; W is N or CR^3; and R^2 and R^3 are each independently hydrogen or chlorine; or an acid addition salt thereof; the process comprising the hydrogenolysis of a compound of formula (II):

(II)



or an acid addition salt thereof, in the presence of a metal, a metal compound or a metal salt under reducing conditions.

US 6,410,738 B1
PHOSPHINITE-OXAZOLINES ANS METAL COMPLEXES THEREOF

Andreas Pfaltz, Binningen, Switzerland; Joerg R. Blankenstein, Pulheim, Germany, and Frederik Menges, Basel, Switzerland, assignors to Solvias AG, Basel, Switzerland

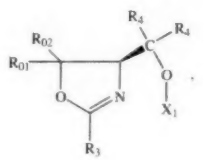
Filed Sep. 20, 2001, Appl. No. 955,981

Int. Cl. C07D *263/10*

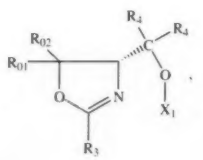
U.S. Cl. 548—112 **13 Claims**

1. A compound of formula I or Ia,

(I)



(Ia)



wherein

X_1 is secondary phosphino;

R_3 is hydrogen, a hydrocarbon radical having from 1 to 20 carbon atoms, a heterohydro-carbon radical, bonded via a carbon atom, having from 2 to 20 atoms and at least one hetero atom selected from the group O, S and NR, or ferrocenyl;

R is H or $C_1–C_4$alkyl;

each R_4 individually or both R_4 together are a hydrocarbon radical having from 1 to 20 carbon atoms; and

R_{01} and R_{02} are each independently of the other a hydrogen atom or a hydrocarbon radical having from 1 to 20 carbon atoms.

US 6,410,739 B1

INDOLE DERIVATIVES AS 5-HT1 AGONISTS

John Eugene Macor, Salem, Conn., and Martin James Wythes, Sutton, United Kingdom, assignors to Pfizer INC, New York, N.Y.

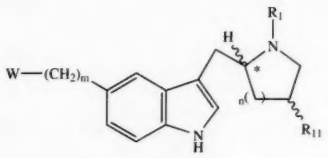
Division of application No. 09/059,799, filed on Apr. 14, 1998, now Pat. No. 6,150,388, which is a division of application No. 08/295,798, filed as application No. PCT/US93/01967, filed on Mar. 10, 1993, now Pat. No. 5,747,501, which is a continuation-in-part of application No. 07/864,737, filed on Apr. 7, 1992, now abandoned. This application Oct. 23, 2000, Appl. No. 694,808.

This patent is subject to a terminal disclaimer.

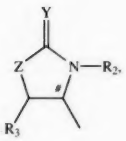
Int. Cl. C07D *233/02;417/06*

U.S. Cl. 548—181 **16 Claims**

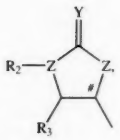
1. A compound of the formula



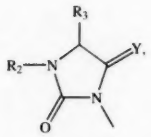
where W is



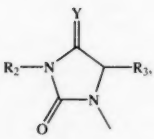
(i)



(ii)



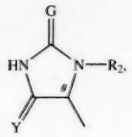
(iii)



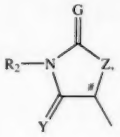
(iv)

-continued

(v)

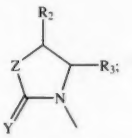


(vi)



or

(vii)



n is 0 or 1; m is 0, 1, 2, or 3: Y and G are each independently oxygen or sulfur; Z is —S—; R_1 is hydrogen, C_1 to C_8 alkyl, C_1 to C_8 alkyl substituted with one hydroxy, C_3 to C_8 alkenyl, C_3 to C_8 alkynyl, aryl, C_1 to C_3 alkylaryl, or —Q–R_4; R_2 and R_3 are each independently hydrogen, C_1 to C_6 alkyl, aryl, or C_1 C_3 alkylaryl; R_4 is cyano, triflurormethyl, —COR_9, —CO_2R_9, —$CONR_9R_{10}$, —OR_9, —$SO_2NR_9R_{10}$, or —$S(O)_qR_9$; R_9 and R_{10} are each independently hydrogen, C_1 C_8 alkyl, C_1 to C_3 alkylaryl, aryl, or R_9 and R_{10} may together be taken to form a three- to seven-membered alkyl ring or a three- to seven-membered heteroalkyl ring having 1 heteroatom of O; Q is C_1 to C_3 alkyl; R_{11} is hydrogen, —OR_{12}, or —$NHCOR_{12}$; R_{12} is hydrogen, C_1 to C_6 alkyl, aryl, or C_1 to C_3 alkyl-aryl; q is 0, 1, or 2; a first chiral carbon is designated by an asterisk; a second chiral carbon is designated by #; the above alkyl, alkenyl, alkynyl, and alkylene moieties of other groups are linear, branched, cyclic, or be linear or branched and containing cyclic moieties; and the above aryl groups and the aryl moieties of the above alkyl-aryl groups are independently selected from phenyl and substituted phenyl, wherein said substituted phenyl may be substituted with one nitro or one to three groups selected from C_1 to C_4 alkyl, halogen, hydroxy, cyano, carboxamido, and C_1 to C_4 alkoxy, and the pharmaceutically acceptable salts thereof.

US 6,410,740 B1

HETEROCYCLYLMETHYL-SUBSTITUTED PYRAZOL DERIVATIVES

Alexander Straub, Wuppertal; Chantal Fürstner, Mülheim/Ruhr; Ulrich Niewöhner, Wermelskirchen; Thomas Jaetsch, Köln; Achim Feurer, Odenthal; Raimund Kast, Wuppertal; Johannes-Peter Stasch, Solingen; Elisabeth Perzborn; Joachim Hütter, both of Wuppertal; Klaus Dembowsky, Schriesheim, and Dieter Arlt, Lemgo, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of application No. 09/284,172, filed as application No. PCT/EP97/05432, filed on Oct. 2, 1997, now Pat. No. 6,166,027. This application Aug. 25, 2000, Appl. No. 645,834.

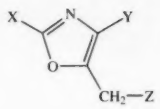
Claims priority, application Germany, Oct. 14, 1996, 196 42 320; Oct. 14, 1996, 196 42 322; Oct. 14, 1996, 196 42 323; Oct. 14, 1996, 196 42 319

Int. Cl. C07D *413/04*

U.S. Cl. 548—235 **4 Claims**

1. Process for the preparation of oxazolyl compounds of the formula (III-XXIX)

(III-XXIX)



in which

X and Y are identical or different and can represent optionally substituted aliphatic, cycloaliphatic, araliphatic, aromatic and heterocyclic radicals, carboxyl, acyl, alkoxy, alkoxycarbonyl or cyano or can represent hydrogen,

wherein the aromatic and heterocyclic radicals can be substituted by one or more substituents which are chosen from the group which consists of:

halogen, formyl, acyl, carboxyl, hydroxyl, alkoxy, aroxy, acyloxy, optionally alkyl-substituted amino, acylamino, aminocarbonyl, alkoxycarbonyl, nitro, cyano, phenyl and

alkyl, which can be substituted by one or more substituents selected from the group consisting of:

halogen, hydroxyl, amino, carboxyl, acyl, alkoxy, alkoxycarbonyl,

heterocyclyl and phenyl, which can be substituted by one or more substitutents selected from the group consisting of:

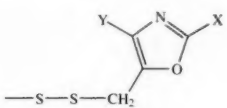
amino, mercaptyl, hydroxyl, formyl, carboxyl, acyl, alkylthio, alkyloxyacyl, alkoxy, alkoxycarbonyl, nitro, cyano, trifluoromethyl, azido, halogen, phenyl and alkyl which is optionally substituted by hydroxyl, carboxyl, acyl, alkoxy and alkoxycarbonyl,

and wherein the aliphatic, cycloaliphatic and araliphatic radicals can be substituted by one or more substituents selected from the group consisting of: fluorine, hydroxyl, alkoxy, aroxy, acyloxy, alkyl-substituted amino, acylamino, aminocarbonyl, alkoxycarbonyl and acyl,

Z is selected from the group consisting of:

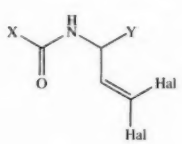
hydroxyl, alkoxy, optionally alkyl- and/or halogen-substituted arylalkoxy, optionally alkyl- and/or halogen-substituted aroxy, aroyloxy, acyloxy, alkylthio, optionally alkyl- and/or halogen-substituted arylthio, diacylimido and a group of the formula (III-XXX)

(III-XX)



in which Y and X have the abovementioned meaning, comprising reacting amides of the formula (III-XXXI)

(III-XXXI)



in which Y and X have the abovementioned meaning and Hal represents chlorine or bromine, with compounds of the formula $M1^{+}Z^{-}$ or $M2^{2+}(Z^{-})_2$, in which M1 is an alkali metal, M2 is an alkaline earth metal and Z is as defined above.

US 6,410,741 B1

OPTICALLY ACTIVE BISOXAZOLINE COMPOUNDS, PRODUCTION AND USE THEREOF

Makoto Itagaki, Takatsuki, and Gohfu Suzukamo, Suita, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of application No. 09/128,971, filed on Aug. 4, 1998, now Pat. No. 6,072,081. This application May 4, 2000, Appl. No. 563,914.

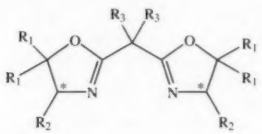
Claims priority, application Japan, Aug. 5, 1997, 9-210417

Int. Cl. C07D *263/08*

U.S. Cl. 548—237 **9 Claims**

1. An optically active isoxazoline compound of the formula [I]:

[I]



wherein

R_1 represents alkyl group, cycloalkyl group, aralkyl group, phenyl group which may be substituted or alkoxy group and two geminal alkyl groups may be joined together to form a cyclic structure,

R_2 represents a phenyl group which may be substituted,

R_3 represents hydrogen atom (C_2–C_4)alkyl group or cycloalkyl group; and

asterisk * represents an asymmetric carbon atom.

US 6,410,742 B1

POLYMORPHS OF TELMISARTAN

Heinrich Schneider, deceased, late of Ingelheim, Germany, by Margarete Schneider, Legal Representative, assignor to Boehringer Ingelheim Pharma KG, Ingelheim, Germany

Division of application No. 09/480,211, filed on Jan. 10, 2000, now Pat. No. 6,358,986, Provisional application No. 60/128,311, filed on Apr. 8, 1999. This application Nov. 16, 2001, Appl. No. 992,621.

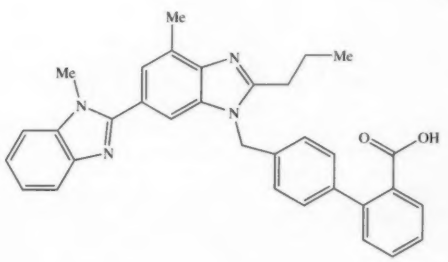
Claims priority, application Germany, Jan. 19, 1999, 199 01 921

Int. Cl. C07D *403/04*

U.S. Cl. 548—305.4 **7 Claims**

1. A process for preparing telmisartan (the compound of formula I)

(I)



comprising a mixture of two polymorphic crystalline forms, wherein the first polymorphic crystalline form, designated form A, has an endothermic maximum at 269±2° C. which occurs during thermal analysis using DSC, and wherein the second polymorphic crystalline form, designated form B, has endothermic maxima at 183±2° C. and at 269±2° C. which occur during thermal analysis using DSC, which process comprises the following steps:

(a) dissolving telmisartan comprising form A but substantially no form B in a mixture of solvents consisting of water, formic acid and an organic solvent that is miscible therewith,
(b) heating the solution created in the preceding step,
(c) distilling the solution to remove the organic solvent,
(d) precipitating the telmisartan comprising forms A and B out of the remaining solution by the addition of a base, and
(e) removing the precipitated telmisartan comprising forms A and B from the solution.

US 6,410,743 B2

TETRAHYDRONAPHTALENE DERIVATIVES AND THEIR USE

Ming Li, Mobile, Ala.; John Bondo Hansen, Jyderup, and Tina Moller Tagmose, Ballerup, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark, and South Alabama Medical Science Foundation, Mobile, Ala.

Continuation of application No. PCT/DK01/00129, filed on Feb. 23, 2001, Provisional application No. 60/185,294, filed on Feb. 28, 2000. This application Mar. 27, 2001, Appl. No. 818,392.

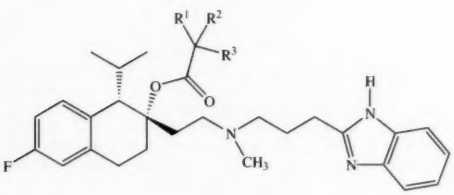
Claims priority, application Denmark, Feb. 25, 2000, 2000 00294

Int. Cl. C07D *233/54;* **A61K** *31/4184*

U.S. Cl. 548—309.7 **18 Claims**

1. A compound of formula (I):

(I)



wherein R^1 is H, C_{1-6}-alkyl or phenyl which is optionally substituted with halogen, methoxy or C_{1-6}-alkyl; and R^2—C—R^3 together forms a C_{3-6}-cycloalkyl group; or a pharmaceutically acceptable salt thereof.

US 6,410,744 B1

CARBONYLDIIMIDAZOLES, THEIR ESTER DERIVATIVES AND METHOD FOR THEIR PRODUCTION

Armin Stamm, Mainz; Manfred Julius, Limburgerhof; Alois Kindler, Hassloch; Michael Henningsen, Frankenthal, and Jörg Botzem, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP98/03516, § 371 Date Dec. 8, 1999, § 102(e) Date Dec. 8, 1999, PCT Pub. No. WO98/56769, PCT Pub. Date Dec. 17, 1998

PCT Filed Jun. 10, 1998, Appl. No. 445,409

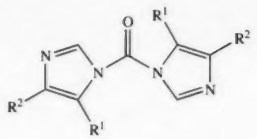
Claims priority, application Germany, Jun. 12, 1997, 197 24 884

Int. Cl. C07D *233/60;233/80*

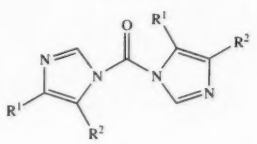
U.S. Cl. 548—313.7 **4 Claims**

1. A process for preparing a carbonyidiimidazole of the formula Ia, Ib, Ic or a mixture thereof

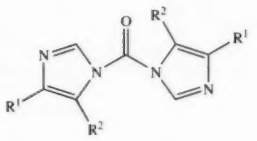
(Ia)



(Ib)

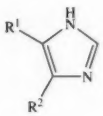


(Ic)

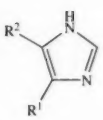


where R^1 is C_{1-4}-alkyl and R^2 is hydrogen or methyl by the reaction of at least one imidazole of the formula IIa or IIb

(IIa)



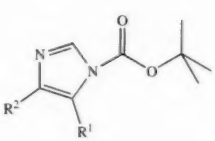
(IIb)



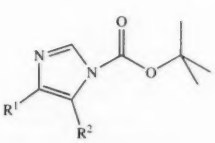
with phosgene in a substituted aromatic hydrocarbon as solvent, wherein the hydrochloride, which is also formed, of said at least one imidazole of the formula IIa or IIb is removed from the reaction mixture by phase separation as a melt.

2. An imidazolecarboxylic ester of the formula IIIa or IIIb or a mixture thereof

(IIIa)



(IIIb)



where R^1 is C_{1-4}-alkyl and R^2 is hydrogen or methyl.

US 6,410,745 B1
PROCESS FOR PREPARING 1-GUANYLPYRAZOLE ACID ADDUCTS

Guido Fries, Recklinghausen, Germany, assignor to Degussa AG, Duesseldorf, Germany

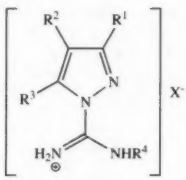
Filed Oct. 10, 2001, Appl. No. 972,897

Claims priority, application Germany, Oct. 13, 2000, 100 50 900

Int. Cl. C07D *231/12*

U.S. Cl. 548—375.1 **12 Claims**

1. A process for preparing 1-guanylpyrazole acid adducts of the formula:



wherein R^1, R^2 and R^3 independently of one another are hydrogen, a branched or straight-chain C_{1-6}-alkyl group, a C_{3-8}-cycloalkyl group or a C_{6-12}-aryl group which is unsubstituted of substituted by 1 to 6 alkyl groups;

R^4 is hydrogen or a straight-chain or branched C_{1-4}-alkyl group; and

X is Cl or Br, which comprises:

conducting the reaction of pyrazole or a derivative thereof with cyanamide or a derivative thereof and gaseous hydrogen chloride or hydrogen bromide in an aprotic solvent, with the proviso that p-dioxane is excluded as an aprotic solvent.

US 6,410,746 B1
METAL CATALTSTS AND METHODS FOR MAKING AND USING SAME

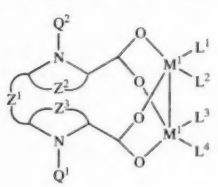
Huw M. L. Davies, Clarence Center, N.Y., assignor to Research Foundation of State University of New York, The, Amherst, N.Y.

Provisional application No. 60/131,262, filed on Apr. 27, 1999. This application Mar. 8, 2000, Appl. No. 521,375.

Int. Cl. C07F *15/00;7/02;9/02;* **B01J** *31/00*

U.S. Cl. 548—403 **34 Claims**

1. A compound having the formula:

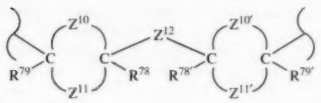


wherein M^1 and M^2 are the same or different and are transition metal atoms or ions; Z^2 and Z^3, independently, are the atoms necessary to complete a 3–12 membered heterocyclic ring; Z^1 is an alkylene or arylene group; Q^1 and Q^2 are the same or different and are electron withdrawing groups; L^1 and L^3, taken together, represent —O—CR^{13}—O—; L^2 and L^4, taken together, represent —O—CR^{14}—C—; and R^{13} and R^{14} are the same or different and are selected from the group consisting of alkyl groups and aryl groups or R^{13} and R^{14} represent alkylene or arylene groups that are directly or indirectly bonded to one another.

13. A compound comprising:

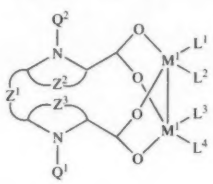
a first metal atom and a second metal atom bonded to one another along an axis and

two carboxylate ligands wherein each of said two carboxylate ligands comprises two carboxylate groups bonded to each other via a moiety having the formula:



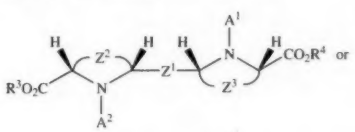
wherein Z^{10} and Z^{11}, together with the atoms to which they are bonded form a 3–12 membered ring; wherein $Z^{10'}$ and $Z^{11'}$, together with the atoms to which they are bonded form a 3–12 membered ring; wherein R^{78}, $R^{78'}$, R^{79}, and $R^{79'}$ are independently selected from the group consisting of H, an alkyl group, and an aryl group; wherein Z^{12} is an alkylene or arylene group; wherein each of said two carboxylate groups comprises a first carboxylate oxygen atom ("O^{1}"), a second carboxylate oxygen atom ("O^{2}"), and a carbon ("C") to which said O^1 and said O^2 are bonded thereby forming two O^1—C—O^2 moieties, each O^1—C—O^2 moiety defining a plane which is substantially parallel to said axis; wherein said O^1 of each of said two carboxylate groups of each of said two carboxylate ligands is bonded to said first metal atom; wherein said O^2 of each of said two carboxylate groups of each of said two carboxylate ligands is bonded to said second metal atom; wherein each of said two carboxylate ligands further comprises at least two chiral centers; and wherein said compound has D_2 symmetry.

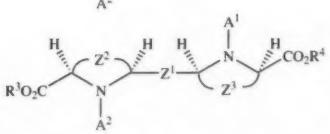
16. A method for making a compound having the formula:



wherein M^1 and M^2 are the same or different and are transition metal atoms or ions; Z^2 and Z^3, independently, are the atoms necessary to complete a 3–12 membered heterocyclic ring; Z^1 is an alkylene or arylene group; and Q^1 and Q^2 are the same or different and are electron withdrawing groups; L^1 and L^3, taken together, represent —O—CHR^{13}—O—; L^2 and L^4, taken together, represent —O—CHR^{14}—O—; and R^{13} and R^{14} are the same or different and are selected from the group consisting of alkyl groups and aryl groups or R^{13} and R^{14} represent alkylene or arylene groups that are directly or indirectly bonded to one another, said method comprising:

providing a ligand having the formula:





or a mixture thereof, wherein each of A^1 and A^2 is independently selected from the group consisting of a hydrogen atom and an electron withdrawing group and each of R^3 and R^4 is independently selected from the group consisting of H, alkyl, and aryl; and

converting the ligand with a bis-metal salt under conditions effective to produce the compound.

US 6,410,747 B1

HIGHLY SELECTIVE BUTYRYLCHOLINESTERASE INHIBITORS FOR THE TREATMENT AND DIAGNOSIS OF ALZHEIMER'S DISEASE AND DEMENTIAS

Nigel H. Greig, Phoenix; Qian-Sheng Yu, Baltimore; Arnold Brossi, Bethesda; Timothy T. Soncrant, Silver Spring, all of Md., and Marvin Hausman, Stevenson, Wash., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

PCT No. PCT/US98/14063, § 371 Date Jun. 17, 1999, § 102(e) Date Jun. 17, 1999, PCT Pub. No. WO99/02154, PCT Pub. Date Jan. 21, 1999

Provisional application No. 60/052,087, filed on Jul. 9, 1997. This PCT application Jul. 9, 1998, Appl. No. 254,494.

Int. Cl. C07D *487/04*

U.S. Cl. 548—429 **6 Claims**

1. The compound N^8-benzylnorcymserine.

US 6,410,748 B1

ALICYCLI C GROUP-CONTAINING MONOMER

Naomi Shida, Kawasaki; Toru Ushirogouchi, Yokohama; Koji Asakawa, Kawasaki; Takeshi Okino; Shuji Hayase, both of Yokohama; Yoshihiko Nakano, and Makoto Nakase, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of application No. 09/143,533, filed on Aug. 28, 1998, now Pat. No. 6,291,129. This application May 3, 2001, Appl. No. 847,387.

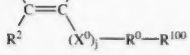
Claims priority, application Japan, Aug. 29, 1997, 9-234393; Aug. 28, 1998, 10-243939

Int. Cl. C07D *209/48;335/00;* **C07F** *7/08;* **C07C** *69/74;69/52;49/00;41/00*

U.S. Cl. 548—475 **3 Claims**

1. A monomer represented by the following formula (m-1):

(m-1)



wherein R^0 is an alicyclic group; R^2s are the same or different and are individually hydrogen atom, halogen atom or monovalent organic group; X^0 is >C=O, —C(=O)O—, —C(=O)NR^3—, —SO_2—, —O—, —S(=O)$_2NR^3$—, —OCH_2C(=O)O—, —OC(=O)—, or —OCH_2C(=O)—, wherein R^3 is hydrogen atom, halogen atom, or hydrocarbon atom; j is an integer of 0 to 3; and R^{100} is a group selected from the following groups:

$$—(X^2)_k—(R^5)_n—Si(R^7)_3 \quad \text{(R1-3)},$$

and

$$—(X^{102})_k—R^4—(X^3)_m—C(R^6)_3 \quad \text{(R11-2)},$$

wherein X^2 is >C=O, —C(=O)O—, —C(=O)NR^3—, —SO_2—, —O—, —S(=O)$_2NR^3$—, —OCH_2C(=O)O—, —OSO_2—, or —S(=O)$_2$O —, wherein R^3 is hydrogen atom, halogen atom or hydrocarbon group; R^5 is a bivalent alkyl group; n is an integer of 0 to 3; R^7s are the same or different and are individually hydrogen atom, halogen atom or monovalent organic group; X^{102} is >C=O, —C(=O)NR^3, —SO_2—, —S(=O)$_2NR^3$—, —OCH_2C(=O)O—, —OSO_2—, or —S(=O)$_2$O—; k is an integer of 1 to 3; R^4 is a bivalent alkyl group; X^3 is >C=O, —C(=O)O—, —C(=O)NR^3—, —SO_2—, —S(=O)$_2NR^3$—, —OC(=O)—, —OCH_2C(=O)O—, —OSO_2—, or —S(=O)$_2$O—; wherein R^3 is hydrogen atom, halogen atom or hydrocarbon group; m is an integer of 0 to 3; R^6s are the same or different and are individually hydrogen atom, halogen atom or monovalent organic group.

US 6,410,749 B1

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE AMINO ALCOHOLS

Eiji Katayama, Odawara; Daisuke Sato, Odawara; Hirohito Ooka, Hadano, and Tsutomu Inoue, Chigasaki, all of Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

PCT No. PCT/JP00/00183, § 371 Date Jul. 17, 2001, § 102(e) Date Jul. 17, 2001, PCT Pub. No. WO00/41997, PCT Pub. Date Jul. 20, 2000

PCT Filed Jan. 18, 2000, Appl. No. 889,595

Claims priority, application Japan, Jan. 18, 1999, 11/009873

Int. Cl. C07D *209/48*

U.S. Cl. 548—478 **3 Claims**

1. A process for preparing optically active β-amino alcohols represented by a general formula (2):

$$Ra—C^*H(OH)—C^*H(Rb)—Rc \quad (2)$$

wherein Ra and Rc are each independently hydrogen, optionally substituted alkyl, optionally substituted cycloalkyl, optionally substituted alkenyl, optionally substituted aralkyl or optionally substituted aryl,

Rb is one member selected from among groups represented by the following general formulae; (3) R1CO(R2)N—, and (4) R1CO(R1'CO)N—, wherein R1, R1' and R2 are each independently hydrogen, optionally substituted alkyl, optionally substituted alkoxy, optionally substituted cycloalkyl, optionally substituted cycloalkoxy, optionally substituted alkenyl, optionally substituted aralkyl, optionally substituted aralkyloxy, optionally substituted aryl or optionally substituted aryloxy, or alternatively R1 and R2 or R1 and R1' may be united to form a five- to eight-membered nitrogenous heterocycle, and C* is an asymmetric carbon atom, characterized by reacting a racemic α-aminocarbonyl compound represented by the general formula (1);

$$Ra—CO—CH(Rb)—Rc \quad (1)$$

wherein Ra, Rb and Rc are each as defined above, with hydrogen in the presence of an optically active transition metal compound represented by a general formula (7);

$$MaXY(Px)m(Nx)n \quad (7)$$

wherein Ma represents a metal atom belonging to VIII-group of the periodic law,

X and Y represent each independently hydrogen, halogeno, carboxyl, hydroxide or alkoxy,

Px represents a phosphine ligand,

Nx represents an amine ligand,

at least one of Px and Nx is optically active,

and m and n each independently represent 0 or an integer of 1 through 4 and a base.

US 6,410,750 B1

PROCESSES AND INTERMEDIATES FOR PREPARING 3(S)-[(5-CHLORO-1H-INDOLE-2-CARBONYL)-AMINO]-2(R)-HYDROXY-4-PHENYL-BUTYRIC ACID

Keith M. DeVries, Chester; Darrell E. Fox, Pawcatuck; Philip D. Hammen, East Haddam; Dennis J. Hoover, Mystic, all of Conn., and Jeffrey B. Jorgensen, Nashville, Tenn., assignors to Pfizer Inc., New York, N.Y.

Provisional application No. 60/139,997, filed on Jun. 18, 1999. This application May 5, 2000, Appl. No. 565,523.

Int. Cl. C07D *209/20*

U.S. Cl. 548—492 **22 Claims**

1. A process for preparing the compound of Formula 6 comprising the steps of:

preparing a solution comprising the compound of Formula 2, comprising, in sequence, adding to the compound of Formula 1 from about 4 mL/g of said compound of Formula 1 to about 30 mL/g of said compound of Formula 1 of an aprotic solvent A, adding an amount of from about 0.0001 mL/g of said compound of Formula 1 to about 0.25 mL/g of said compound of Formula 1 of a catalytic aprotic solvent with agitation under an inert gas, and adding from about 0.95 moles/mole of said compound of Formula 1 to about 2.0 moles/mole of said compound of Formula 1 of an activating agent;

preparing a compound of Formula 4 comprising, in sequence, adding the compound of Formula 3 and from about 1.9 moles/mole of said compound of Formula 3 to about 3.0 moles/mole of said compound of Formula 3 of a base to a mixture of from about 3 mL/g of said compound of Formula 3 to about 30 mL/g of said compound of Formula 3 of an aprotic solvent B and from about 3 mL/g of said compound of Formula 3 to about 30 mL/g of said compound of Formula 3 of a protic solvent, at a temperature of from about −20° C. to about the reflux temperature of said mixture, and maintaining the pH of said mixture at from about pH 8 to about pH 13;

preparing a compound of Formula 5 comprising, in sequence, adding said solution to said mixture, under said inert gas, while maintaining said temperature and, after said addition is complete, allowing said mixture to reach room temperature;

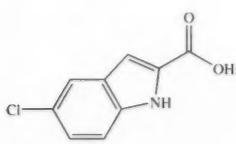
adding an amount of from about 3 mL/g of said compound of Formula 3 to about 30 mL/g of said compound of Formula 3 of an organic solvent to said mixture; and

extracting said compound of Formula 6 into said organic solvent comprising, in sequence, separating the aqueous layer A and the organic layer A, treating said organic layer A with an aqueous acid solution, or with an aqueous acid solution and H_2O, separating the aqueous layer B from the organic layer B, and retaining said organic layer B; wherein:

M^+ is any monovalent cation, provided that, where M^+ is $N(C_1–C_6\ alkyl)_4^+$, tetra-$C_1–C_6$ ammonium halide is added to said mixture after said base;

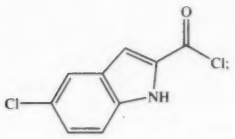
said compound of Formula 1 is

1



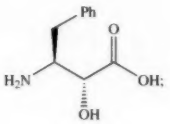
said compound of Formula 2 is

2



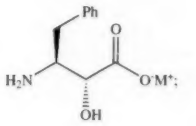
said compound of Formula 3 is

3



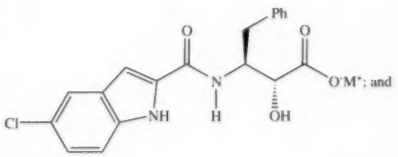
said compound of Formula 4 is

4



said compound of Formula 5 is

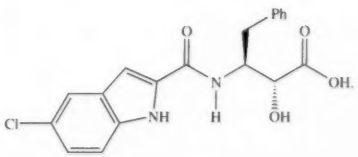
5



and

said compound of Formula 6 is

6



US 6,410,751 B1
WATER SOLUBLE TRI-SUBSTITUTED 1, 2-DIOXETANE COMPOUNDS HAVING INCREASED STORAGE STABILITY, SYNTHETIC PROCESSES AND INTERMEDIATES

Hashem Akhavan-Tafti, Brighton; Renuka DeSilva, Northville; Kumar Thakur, and Zahra Arghavani, both of Southfield, all of Mich., assignors to Lumigen, Inc., Southfield, Mich.

Division of application No. 09/506,263, filed on Feb. 17, 2000, now Pat. No. 6,245,928, application No. 09/101,331, filed as application No. PCT/US97/19618, filed on Nov. 7, 1997, now Pat. No. 6,036,892, which is a continuation-in-part of application No. 08/748,107, filed on Nov. 8, 1996, now Pat. No. 5,721,370, which is a continuation-in-part of application No. 08/509,305, filed on Jul. 31, 1995, now Pat. No. 5,777,135.

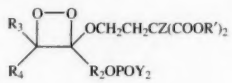
This application Apr. 20, 2001, Appl. No. 839,472.

This patent is subject to a terminal disclaimer.

Int. Cl. C07F *9/09;* **C07D** *321/00*

U.S. Cl. 549—218 **10 Claims**

1. A dioxetane of the formula:



wherein R_3 and R_4 are each selected from the group consisting of acyclic, cyclic and polycyclic organic groups which can optionally be substituted with heteroatoms and which can optionally be joined together to form a cyclic or polycyclic ring group spiro-fused to the dioxetane ring, wherein R_2 is an aryl ring group selected from the group consisting of phenyl and naphthyl groups which can include additional substituents, wherein Z is selected from the group consisting of a fluorine atom and an alkyl group of 1–4 carbons, wherein each R' is an alkyl group of 1–4 carbons and each Y is selected from halogen atoms, substituted or unsubstituted alkoxy, aryloxy, aralkyloxy and trialkylsilyloxy groups.

US 6,410,752 B1
TOCOPHEROL DERIVATIVES AND METHOD FOR PREPARATION THEREOF

Kil Joong Kim, Suwon-shi; Duck Hee Kim, Seoul; Ho Sik Rho, Euiwang-shi; Jae Won You, Seoul; Chun Ja Nam, Suwon-shi; Jong Eoun Hong, Seoul; Hak Hee Kang, Seongnam-shi, and Ih Seob Chang, Yongin-shi, all of Rep. of Korea, assignors to Pacific Corporation, Seoul, Rep. of Korea

Filed Jan. 9, 2001, Appl. No. 756,179

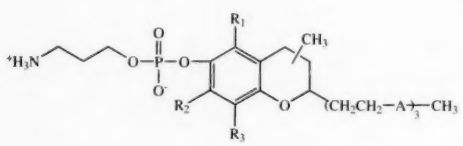
Claims priority, application Rep. of Korea, Aug. 29, 2000, 2000-50330

Int. Cl. C07F *9/06;* **C07D** *311/72*

U.S. Cl. 549—220 **4 Claims**

1. The tocopherol derivatives represented by a following general formula (I) or their salts:

(I)



Wherein,

R_1, R_2 and R_3 are H or methyl group, and at least one positions selected from group consisting of the R_1, R_2 and R_3 positions are methyl group; and,

A is CH_2—$CH(CH_3)$— or CH=$C(CH_3)$—.

US 6,410,753 B2
PROCESS FOR PRODUCING TRIMELLITIC ANHYDRIDE

Kazuo Tanaka; Hiroshi Ogawa, and Ikutaro Maruki, all of Kurashiki, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed May 22, 2001, Appl. No. 861,627

Claims priority, application Japan, Jun. 9, 2000, 2000-173925; Jun. 23, 2000, 2000-189163

Int. Cl. C07D *307/89*

U.S. Cl. 549—245 **17 Claims**

1. A process for producing trimellitic anhydride which comprises performing liquid phase oxidation of a raw material comprising pseudocumene containing 5% by weight or above of a dimethyl benzaldehyde with air in an aliphatic monocarboxylic acid having 1 to 5 carbon atoms as a solvent in the presence of a catalyst comprising both each metal of cobalt, manganese and zirconium and bromine to obtain trimellitic acid and then heat dehydrating trimellitic acid thus obtained, thereby producing trimellitic anhydride.

US 6,410,754 B1
PHOTOCHROMIC SPIROPYRANS, AND COMPOSITIONS AND ARTICLES CONTAINING SAME

Gérard Soula, Meyzieu, and You-Ping Chan, Lyons, both of France, assignors to Flamel Technologies, Venissieux, France

PCT No. PCT/FR96/00429, § 371 Date Nov. 14, 1997, § 102(e) Date Nov. 14, 1997, PCT Pub. No. WO95/03739, PCT Pub. Date Oct. 3, 1996

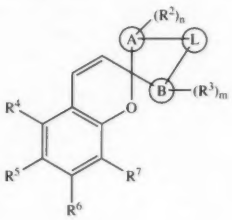
PCT Filed Mar. 21, 1996, Appl. No. 913,620

Claims priority, application France, Mar. 24, 1995, 95 03739

Int. Cl. C07D *241/36;213/22;311/96*

U.S. Cl. 549—331 **38 Claims**

1. A compound having the following formula (I):



in which:

R^2, R^3, R^4, R^5, R^6 and R^7 are identical or different and are:

hydrogen,

an alkyl, cycloalkyl, alkenyl, alkynyl, aryl or heteroaryl group or an aryloxy or aralkyl group, said group optionally being halogenated,

a halogen, OR, SR, —OCOR or —COOR, where R=H, alkyl, cycloalkyl or aryl,

a polyether group, an ether group, a polyamide, an amide group, a polycarbonate group, a carbonate, a polycarbamate, a carbamate, a polyurea, a urea group, a polyester group or an ester group,

an amrino radical which—once bonded in (I)—produces a primary, secondary or tertiary amine, said amine being monosubstituted or disubstituted by alkyl, aryl or aralkyl, depending on its type,

or a cyclic or heterocyclic amino radical,

or an electron-attracting group,

n and m independently of one another take the values 0 to 4,

and wherein a bonding unit L is provided between two moieties A and B consisting of aromatic or heteroaromatic rings wherein A and B are identical or different, said bonding unit L being selected from the following group of radicals:

where:

R^8 and R^9 are identical or different and are a linear or branched C_1–C_{12} alkyl, a C_1–C_{12} cycloalkyl, an aralkyl or an alkylaryl, x=1 to 3.

US 6,410,755 B1

METHOD OF VITAMIN PRODUCTION

James R. Millis, Kohler, Wis.; Gabriel G. Saucy, Essex Fells, N.J.; Julie Maurina-Brunker, Appleton, and Thomas W. McMullin, Maintowoc, both of Wis., assignors to DCV, Inc., Manitowoc, Wis.

Provisional application No. 60/091,868, filed on Jul. 6, 1998, Provisional application No. 60/091,983, filed on Jul. 6, 1998. This application Jul. 6, 1999, Appl. No. 348,097.

Int. Cl. C07D *311/72*

U.S. Cl. 549—408 **20 Claims**

1. A method for producing α-tocopherol or α-tocopheryl esters comprising:

(a) culturing a microorganism in a fermentation medium to produce geranylgeraniol having first, second, third and fourth olefin moieties,

(b) reducing at least one of said second, third and fourth double bonds of said geranylgeraniol to form an allylic alcohol selected from the group consisting of phytol and isophytol; and,

(c) forming α-tocopherol or an α-tocopheryl ester from said allylic alcohol and a hydroquinone.

US 6,410,756 B1

FAMILY OF CANADENSOL TAXANES, THE SEMI-SYNTHETIC PREPARATION AND THERAPEUTIC USE THEREOF

Lolita Zamir, Westmount; Gaéton Caron, Laval, both of Canada, and Yi Feng Zheng, Salt Lake City, Utah, assignors to Institut National de la Recherche Scientifique, Sainte-Foy, Canada

Filed Oct. 24, 1997, Appl. No. 957,138

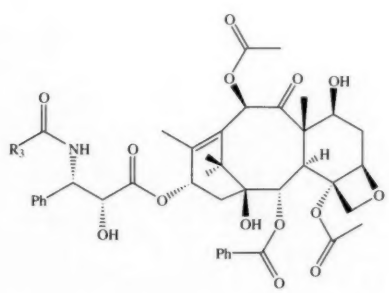
Claims priority, application Canada, Oct. 24, 1996, 2188714; Feb. 12, 1997, 2197369

Int. Cl. C07D *305/14*

U.S. Cl. 549—510 **21 Claims**

1. A process for the preparation of a compound of formula III:

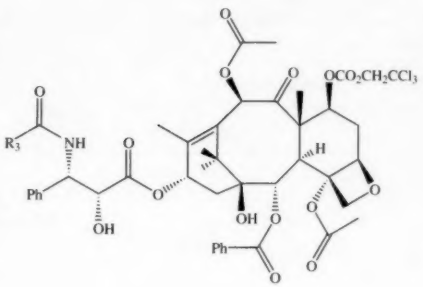
(III)



where R_3 is selected from the group consisting of n-propyl, isopropyl and n-butyl, or a pharmaceutically acceptable salt thereof; which comprises:

(a) deprotecting a compound of formula IV:

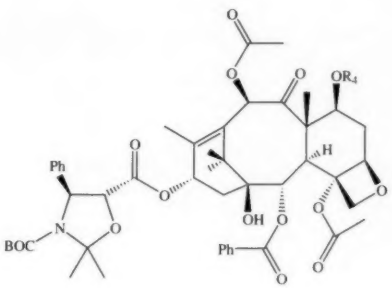
(IV)



wherein R_3 is selected from the group consisting of n-propyl, isopropyl and n-butyl; or:

(b) treating the compound of formula V:

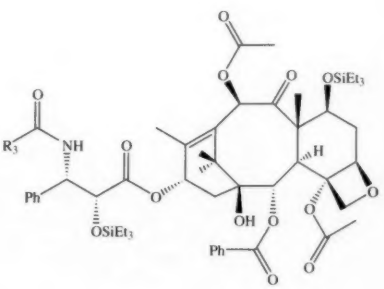
(V)



wherein R_4 is —$SiEt_3$; with organic acid, followed by an acylation step using bicarbonate and an acyl chloride in a one pot reaction, or

(c) deprotecting a compound of formula VI:

(VI)



wherein R_3 is selected from the group consisting of n-propyl, isopropyl and n-butyl.

US 6,410,757 B1

BACCATIN DERIVATIVES AND A PROCESS FOR PRODUCING THE SAME

Tadakatsu Mandai, 1174-371, Tsurajima, Tsurajima-cho, Kurashiki-shi, Okayama-ken; Hiroshi Okumoto, Okayama-ken; Katsuyoshi Nakanishi, Yokohama; Koji Hara, Yokohama; Katsuhiko Mikuni, Yokohama, and Kozo Hara, Yokohama, all of Japan, assignors to Bio Research Corporation of Yokohama; Ensuiko Sugar Refining Co. Ltd., both of Yokohama, and Tadakatsu Mandai, Kurashiki, all of Japan

Filed Feb. 7, 2000, Appl. No. 499,393

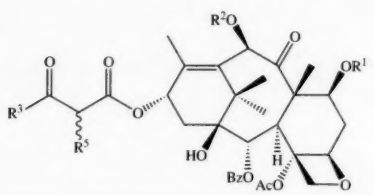
Claims priority, application Japan, Feb. 16, 1999, 11-037055; Aug. 2, 1999, 11-218730

Int. Cl. C07D *305/14*

U.S. Cl. 549—510 **20 Claims**

1. A baccatin derivative represented by the general formula (I):

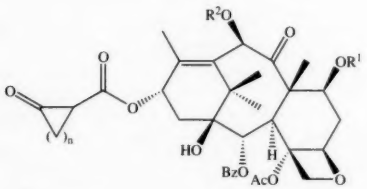
(I)



(wherein R^1 and R^2 simultaneously or independently represent a hydroxyl-protecting group, R^3 represents any one group selected from the group of an unsubstituted or substituted phenyl group, an unsubstituted or substituted furyl group, an unsubstituted or substituted pyridinyl group, an alkyl group, a hydroxyalkyl group, a halogenated alkyl group, a cyclic alkyl group and a thienyl group, R^5 represents a hydrogen atom or an alkyl group, Bz represents abenzoyl group, and Ac represents an acetyl group).

6. A baccatin derivative represented by the general formula (III):

(III)



(wherein R^1 and R^2 simultaneously or independently represent a hydroxyl-protecting group, n is an integer of 1 to 5, Bz represents a benzoyl group, and Ac represents an acetyl group).

US 6,410,758 B2

PREPARATION OF STEROL AND STANOL-ESTERS

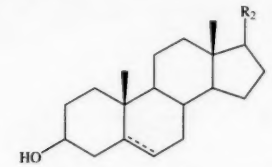
Allan Roden, Noblesville, Ind.; James L. Williams, Reynoldsburg, Ohio; Ruey Bruce, Columbus, Ohio; Frank Detrano, Lancaster, Ohio, and Marie H. Boyer, Fort Washington, Pa., assignors to McNeil-PPC, Inc., Skillman, N.J.

Filed May 24, 1999, Appl. No. 317,712

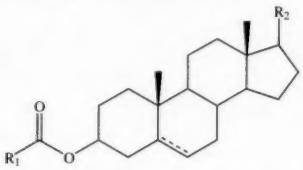
Int. Cl. C07J *9/00*

U.S. Cl. 552—544 **16 Claims**

1. A method for producing stanol/sterol-esters comprising providing a stanol/sterol of the formula



providing less than about 10% molar excess of a C_4-C_{24} acid relative to the sterol/stanol, admixing and heating said stanol/sterol and acid at a temperature of from about 150 to about 260° C., free of catalyst and added solvents, resulting in the production of the substantially discrete corresponding food grade stanol/sterol ester of the formula,



wherein R_1 is a carbon chain having a length of from about from about C_4 to about C_{24}; and R_2 is a carbon chain having a length of from about C_3 to about C_{15}.

US 6,410,759 B1

DIHYDROXYCHOLESTEROL HYDROXYLATED AT 17- AND 25-POSITIONS

Koji Takeda, Iwata; Tadashi Terasawa, Yatsushiro; Kazuyuki Dobashi, Hadano, and Takeo Yoshioka, Ayase, all of Japan, assignors to Mercian Corporation, Tokyo, Japan

Division of application No. 09/029,160, filed as application No. PCT/JP96/02369, filed on Aug. 26, 1996, now Pat. No. 6,146,544. This application Jul. 31, 2000, Appl. No. 629,454.

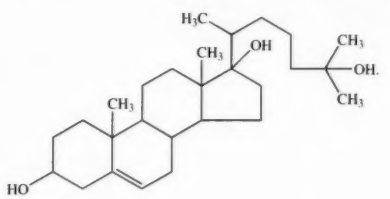
Claims priority, application Japan, Aug. 28, 1995, 7-240641; Nov. 15, 1995, 7-319758; Nov. 16, 1995, 7-321250

Int. Cl. C07J *9/00*

U.S. Cl. 552—546 **1 Claim**

1. Dihydroxycholesterol having formula (II-b):

(II-b)



US 6,410,760 B1

PROCESS TO PREPARE ANDROST-4-EN-17-CARBOXYLIC ACID

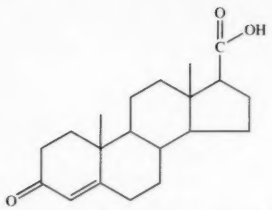
Kevin C. Grega, Marcellus, and Scott W. Ashford, Kalamazoo, both of Mich., assignors to Pharmacia & Upjohn Company, Kalamazoo, Mich.

Provisional application No. 60/159,272, filed on Oct. 13, 1999. This application Oct. 2, 2000, Appl. No. 678,702.

Int. Cl. C07J *3/00*

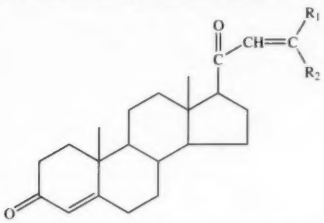
U.S. Cl. 552—611 **18 Claims**

1. A process for the production of 17β-carboxyandrost-4-en-3-one (IV) or anion thereof,



which comprises contacting a steroidal ketone (III)

(III)



where R_1 is selected from the group consisting of:

—OH,

—OR_{1-1} where R_{1-1} is:

C_1–C_6 alkyl,

trimethylsilyl,

—CH_2—C_6H_5,

where R_2 is selected from the group consisting of:

—H,

—OR_{2-1} where R_{2-1} is:

C_1–C_6 alkyl,

trimethylsilyl,

—C_6H_5,

—CH_2—C_6H_5,

—OH,

C_1–C_{12} alkyl,

C_3–C_7 cycloalkyl,

—CO—OR_{2-3} where R_{2-3} is:

C_1–C_6 alkyl,

C_3–C_7 cycloalkyl,

—C_6H_5,

—CO—NHR_{2-3} where R_{2-3} is as defined above,

—CO—$NR_{2-4}R_{2-5}$ where R_{2-4} and R_{2-5} are the same or different and are C_1–C_6 alkyl,

-phenyl optionally substituted with 1 or 2 —F, —Cl, —Br, —CH_3, —NH_2, —NO_2, —OH, —OCH_3,

C_3–C_7 cycloalkyl,

C_1–C_{12} alkyl, with K_2SO_5.$KHSO_4$.K_2SO_4.

US 6,410,761 B1

CONJUGATED LINOLEIC ACID COMPOSITIONS AND METHODS OF MAKING SAME

Asgeir Saebo, Oersta, Norway; Carl Skarie, Detroit Lakes; Daria Jerome, Owatonna, both of Minn., and Gudmunder Haroldsson, Reykjavik, Iceland, assignors to Conlinco, Inc., Detroit Lakes, Minn.

Continuation-in-part of application No. 09/132,593, filed on Aug. 11, 1998, which is a continuation-in-part of application No. 09/160,416, filed on Sep. 25, 1998, which is a continuation-in-part of application No. 09/042,538, filed on Mar. 17, 1998, now abandoned, which is a continuation-in-part of application No. 09/042,767, filed on Mar. 17, 1998, now Pat. No. 6,015,833. This application Mar. 17, 1999, Appl. No. 270,940.

Int. Cl. C11C *3/00*

U.S. Cl. 554—126 **6 Claims**

1. A process for producing low impurity biologically active conjugated linoleic acid comprising

providing a linoleic acid containing seed oil, propylene glycol, and an alkali compatible with a nonaqueous medium;

forming a blended reaction mix with said linoleic acid containing seed oil, said propylene glycol, and said alkali compatible with a nonaqueous medium;

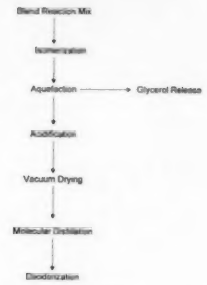
isomerizing said linoleic acid containing seed oil by heating to form conjugated linoleic acids; and

aquefying to release glycerol;

molecularly distilling said conjugated linoleic acids to form purified conjugated linoleic acids; and

treating said purified conjugated linoleic acids with lipase in the presence of glycerol to form triglycerides.

(IV)



US 6,410,762 B1

PROCESS FOR THE ISOLATION OF ORYZANOLS FROM RICE BRAN OIL SOAP STOCK

Kasturi Venkata Sesha Adinarayana Rao; Bhamidipati Venkata Surya Koppeswara Rao, and Narayana Balagopala Kaimal Thengumpillil, all of Hyderabad, India, assignors to Council of Scientific and Industrial Research, New Delhi, India

Filed Mar. 20, 2001, Appl. No. 813,109

Int. Cl. C11B *13/02*

U.S. Cl. 554—192 **8 Claims**

1. A process for the isolation of oryzanols from rice bran oil soap stock, said process comprising (a) saponifying the oil present in soap stock with an alkali followed by neutralisation of the excess alkali, (b) converting the soap stock into anhydrous, porous soap noodles, (c) extracting the soap noodles with an organic solvent, (d) crystallising the crude unsaponifiable matter to remove impurities, (e) subjecting the residue to column chromatography to obtain an oryzanol rich fraction, and (f) recrystallising the oryzanol rich fraction using an organic solvent to obtain pure oryzanol.

US 6,410,763 B1

LIQUID CHROMATOGRAPHY OF HIGH PURITY CONJUGATED FATTY ACID

Michael C. Seidel, 61 Hickory La., Chalfont, Pa. 18914

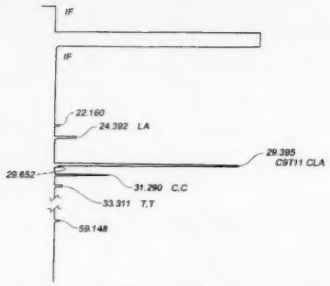
Continuation-in-part of application No. 09/283,504, filed on Apr. 1, 1999, now Pat. No. 6,153,774. This application Nov. 24, 2000, Appl. No. 721,849.

Int. Cl. C11B *7/00*

U.S. Cl. 554—193 **20 Claims**

1. A method for providing a purified conjugated fatty acid, comprising:

providing a purified conjugated fatty acid formed by separating by liquid chromatography a conjugated fatty acid formed by reacting an ester of a fatty acid having a four carbon chain such that carbon one bears one hydrogen and one hydroxyl group, carbon two bears two hydrogen atoms, and a double bond is positioned between carbon three and carbon four, with a tosyl chloride or a mesyl chloride to form a tosylate or mesylate of an ester of fatty acid having a four carbon chain



such that carbon one bears one hydrogen and one hydroxyl group, carbon two bears two hydrogen atoms, and a double bond is positioned between carbon three and carbon four, and reacting said tosylate or mesylate with diazabicycloundecene.

US 6,410,764 B1

METHOD FOR PREPARATION OF BORATABENZENE DERIVATIVES

Leonard V. Cribbs, Hamilton, and Bradley P. Etherton, Cincinnati, both of Ohio, assignors to Equistar Chemicals, L.P., Houston, Tex.

Filed Jan. 18, 2001, Appl. No. 764,722
Int. Cl. C07F *5/02*
U.S. Cl. 556—7 **16 Claims**

1. A process for the preparation of a boratabenzene complex having the formula:

(I)

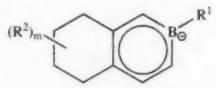
where

M is a metal selected from Groups 4 to 10 of the Periodic Table;

n is such that the complex (I) is neutral;

each X individually is a halogen, a C_{1-8} alkyl group, a C_{6-10} aryl group, a C_{7-15} aralkyl group, a C_{1-10} alkoxy group, or a C_{1-10} dialkylamino group, each of these groups optionally substituted with one or more halogens, cyano groups, C_{1-4} alkoxy groups, or C_{1-4} alkyl groups;

L_1 is a hydrogenated boranaphthalene ligand with the structure:


(II)

where

R^1 is hydrogen, a C_{1-8} alkyl group, a C_{6-10} aryl group, a C_{7-15} aralkyl group, a C_{1-10} alkoxy group, a C_{6-14} aryloxy group, a C_{1-8} dialkylamino group, or a C_{6-15} diarylamino group;

each R^2 individually is a C_{1-8} alkyl group or a C_{6-10} aryl group;

m is 0 to 4; and

L_2 is a second hydrogenated boranaphthalene ligand, a boratabenzene ligand, or an optionally substituted cyclopentadienyl ring;

said process comprising hydrogenating a boranaphthalene compound with hydrogen in the presence of a hydrogenation catalyst to form said hydrogenated boranaphthalene ligand(s), said process comprising at least one of the alternatives a) through c):

a) selecting as said boranaphthalene compound a compound having the structure:

(IV)

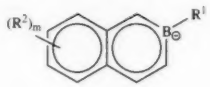
where

M is a metal selected from Groups 4 to 10 of the Periodic Table;

n is such that the complex (IV) is neutral;

each X independently is a halogen, a C_{1-8} alkyl group, a C_{6-10} aryl group, a C_{7-15} aralkyl group, a C_{1-10} alkoxy group, or a C_{1-10} dialkylamino group, each of these groups optionally substituted with one or more halogens, cyano groups, C_{1-4} alkoxy groups, or C_{1-4} alkyl groups,

where L_3 is a boranaphthalene ligand having the structure:


(III)

wherein L_4 is L_3 or is a boratabenzene ligand, or an optionally substituted cyclopentadienyl ring, and hydrogenating said compound (IV) to form said boratabenzene complex (I);

b) selecting as said boranaphthalene compound a compound having the formula:

(V)

and hydrogenating said boranaphthalene compound (V) to form a boratabenzene complex having the formula:

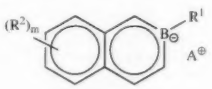
(VI)

and reacting said boratabenzene complex VI with a compound of the formula:

$$L_4^{\ominus}A^{\oplus} \qquad \text{(VII)}$$

wherein $A^{\oplus}$ is the cation of a strong base, and $L_4^{\ominus}$ is a boranaphthalene anion, a hydrogenated boranaphthalene anion, a boratabenzene anion, or a cyclopentadienyl anion, all of said anions optionally substituted, to form said boratabenzene complex of the formula (I);

c) selecting a boranaphthalene compound having the formula:


(III')

hydrogenating said boranaphthalene compound (III') to form a hydrogenated boranaphthalene compound having the formula:

(II')

reacting said hydrogenated boranaphthalene compound (II') with a metal complex having the formula:

(VIII)

to form a boratabenzene complex of the formula (I).

US 6,410,765 B1
METHODS OF MAKING FUNCTIONALIZED NANOPARTICLES

Stephen T. Wellinghoff, San Antonio; Hong Dixon, Helotes; Henry R. Rawls, and Barry K. Norling, both of San Antonio, all of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Division of application No. 09/103,197, filed on Jun. 23, 1998, now Pat. No. 6,258,974, which is a continuation-in-part of application No. 08/721,742, filed on Sep. 27, 1996, now abandoned, which is a continuation-in-part of application No. 08/298,836, filed on Aug. 31, 1994, now Pat. No. 5,670,583, which is a division of application No. 08/047,750, filed on Apr. 13, 1993, now Pat. No. 5,372,796. This application Oct. 17, 2000, Appl. No. 690,527.

Int. Cl. C07F *9/08;7/02*

U.S. Cl. 556—10 **40 Claims**

1. A method of making amphoteric metal oxide particles comprising:

providing metal oxide particles comprising a surface comprising hydroxyl groups;

exposing said hydroxyl groups to a hydrolytically unstable phosphate ester under conditions effective to form a phosphonate linkage between said phosphate ester and said metal.

7. The method of claim **1** wherein said metal oxide is tantalum oxide.

26. The method of claim **1** wherein said phosphate ester comprises a liquid crystal monomer selected from the group consisting of bis-(4-(6-acryloyloxy-A-1-oxy)benzoyl)2-(t-butyl) quinone and bis-(4-(10-acryloyloxy-A-1-oxy)benzoyl)2-(t-butyl) quinone in which A comprises an alkyl group having from about 6 to 10 carbon atoms, and mixtures thereof.

US 6,410,766 B2
EMITTING MATERIALS USED FOR ORGANIC EL BASED ON TRIDENTATE LIGANDS

Yong Qiu, and Yan Shao, both of Beijing, China, assignors to Tsinghau University, Beijing, China

Filed Jan. 5, 2001, Appl. No. 755,688

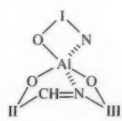
Claims priority, application China, Jan. 7, 2000, 00100040 A

Int. Cl. C07F *5/06*

U.S. Cl. 556—33 **11 Claims**

1. A compound of Formula 1 wherein the group O-I-N is a bidentate ligand, and II and III are unsubstituted or substituted aryl groups.

Formula 1



US 6,410,767 B2
SILYLATED AND N-SILYLATED COMPOUND SYNTHESIS

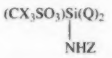
Daniel A. Gately, Berthoud, Colo., assignor to Boulder Scientific Co., Mead, Colo.

Division of application No. 09/016,641, filed on Jan. 30, 1998. This application Mar. 26, 2001, Appl. No. 816,496.

Int. Cl. C07F *7/10*

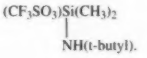
U.S. Cl. 556—410 **2 Claims**

1. A method for preparing an N-silylated mono- or bis- cyclopentadienyl or indenyl compound which comprises reacting a lithiated mono- or bis- cyclopentadienyl or indenyl compound with a compound of the formula:



in which X is H or F, Q is an alkyl or aryl hydrocarbyl group, and Z is an alkyl or aryl hydrocarbyl group which may be the same or different from Q.

2. A method for preparing an N-silylated mono- or bis- cyclopentadienyl or indenyl compound which comprises reacting a lithiated mono- or bis- cyclopentadienyl or indenyl compound with the compound



US 6,410,768 B1
DIIMINO COMPOUNDS

Luis Mendez Llatas, Mostoles; Antonio Muñoz-Escalona Lafuente, Madrid; Juan Campora Perez, Sevilla; Ernesto Carmona Guzman, Sevilla, and Manuel Lopez Reyes, Sevilla, all of Spain, assignors to Repsol Quimica S.A., Madrid, Spain

Filed Mar. 12, 2001, Appl. No. 804,370

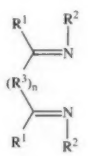
Claims priority, application European Pat. Off., Mar. 13, 2000, 00500040

Int. Cl. C07F *7/10*

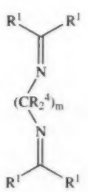
U.S. Cl. 556—424 **15 Claims**

1. Diimino compounds represented by the following formulae:

I



II



wherein

n is 0 or 1; m is 1, 2 or 3;

each R^1, equal to or different from each other, is selected from the group consisting of: hydrogen, a monovalent aliphatic or aromatic hydrocarbon group, optionally containing heteroatoms of group 14 to 16 of the periodic table of the elements

and/or boron; with the proviso that at least one R^1 group is represented by the formula $R^5OSi(R)_3$;

wherein

each R, equal to or different from each other, is selected from the group consisting of: C_1–C_{20} alkyl, C_3–C_{20} cycloalkyl, C_6–C_{20} aryl, C_2–C_{20} alkenyl, C_7–C_{20} arylalkyl, C_7–C_{20} alkylaryl, C_8–C_{20} arylalkenyl, C_8–C_{20} alkenylaryl;

each R^5, equal to or different from each other, is a divalent aliphatic or aromatic hydrocarbon group containing from 1 to 20 carbon atoms, optionally containing from 1 to 5 heteroatoms of groups 14 to 16 of the periodic table of the elements and/or boron;

each R^2, equal to or different from each other, is a radical which contains from 1 to 20 carbon atoms; this group optionally contains heteroatoms of group 14 to 16 of the periodic table of the elements and boron; R^3 is a divalent aliphatic or aromatic hydrocarbon group containing from 1 to 20 carbon atoms, optionally containing from 1 to 5 heteroatoms of groups 14, 15 and 16 of the periodic table of the elements and/or boron; each R^4, equal to or different from each other, is hydrogen or a radical which contains from 1 to 20 carbon atoms; this group optionally contains heteroatoms of group 14 to 16 of the periodic table of the elements and/or boron;

two or more R^1, R^2, R^3, R^4 and R^5 can also unite to form a 4 to 15-membered aliphatic or aromatic ring; the ring optionally contains heteroatoms of group 14 to 16 of the periodic table of the elements and/or boron.

US 6,410,769 B1

GRANULAR ORGANOSILANE PREPARATION, PROCESS FOR THE PRODUCTION THEREOF AND USE THEREOF

Kurt Eichenauer, Bad Soden-Salmünster; Holger Pitsch, Mainhausen; Michael Klose, Frankfurt am Main; Conny Vogler, Bornheim-Sechtem; Jan Kopietz, Hürth-Efferen, and Helmut Kriesch, Frechen, all of Germany, assignors to Degussa Muls AG, Frankfurt am Main, Germany

Filed Nov. 20, 2000, Appl. No. 715,038

Claims priority, application Germany, Nov. 20, 1999, 199 55 850

Int. Cl. C07F *7/08*

U.S. Cl. 556—427 **11 Claims**

1. A granular organosilane preparation comprising a mixture of one or more organosilanes and one or more fillers, having a fines content of less than 2%.

US 6,410,770 B2

CHLORIDE-FREE PROCESS FOR THE PRODUCTION OF ALKYLSILANES SUITABLE FOR MICROELECTRONIC APPLICATIONS

Barry C. Arkles, Dresher; Youlin Pan, Langhorne, and Gerald Larson, Newtown, all of Pa., assignors to Gelest, Inc., Tullytown, Pa.

Provisional application No. 60/181,140, filed on Feb. 8, 2000. This application Feb. 7, 2001, Appl. No. 779,025.

Int. Cl. C07F *7/08*

U.S. Cl. 556—466 **15 Claims**

1. A process for producing an alkylsilane, comprising reducing an alkoxysilane in the presence of an alkali metal hydride in the presence of a solvent to form an alkylsilane, wherein the alkylsilane has a boiling point lower than a boiling point of the solvent.

US 6,410,771 B1

FLUORINATED COPPER SALTS AS CATALYSTS FOR THE SYNTHESIS OF TRIALKOXYSILANES

Alexandra Brand, Darmstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jul. 11, 2001, Appl. No. 901,893

Claims priority, application Germany, Jul. 13, 2000, 100 33 964

Int. Cl. C07F *7/18*

U.S. Cl. 556—470 **12 Claims**

1. A process for preparing trialkoxysilanes by reaction of silicon metal with an alcohol in an inert solvent in the presence of a copper catalyst, wherein the copper catalyst used is a copper salt whose anion contains at least one nonhydrolyzable fluorine atom, or a mixture thereof with other salts.

US 6,410,772 B2

CONTINUOUS HYDROSILYLATION METHOD FOR PRODUCTION OF A MODIFIED LIQUID ORGANOSILICON COMPOUND

Toshio Okuyama, Midland, Mich.; Naoya Matsui, and Takao Takemasa, both of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Feb. 9, 2001, Appl. No. 780,074

Claims priority, application Japan, Apr. 13, 2000, 2000-112462

Int. Cl. C07F *7/08*

U.S. Cl. 556—479 **15 Claims**

1. A continuous method for performing a hydrosilylation reaction comprising effecting a hydrosilylation reaction between a liquid organosilicon compound (A) having in each molecule at least one silicon-bonded hydrogen atom and a liquid organosilicon compound (B) having in each molecule at least one aliphatic unsaturated bond in the presence of a platinum catalyst (C) continuously in a tubular reactor equipped with a stirring and plug-flow maintaining apparatus located within the reactor.

US 6,410,773 B1

SULFONIC ACID ESTER DERIVATIVES, METHOD FOR PRODUCTION THEREOF AND USE THEREOF

Yoshihiko Yasohara; Kenji Miyamoto; Shigeru Kawano, and Junzo Hasegawa, all of Hyogo, Japan, assignors to Kaneka Corporation, Osaka, Japan

Division of application No. 09/230,686, filed as application No. PCT/JP97/02699, filed on Aug. 1, 1997, now Pat. No. 6,121,477. This application Feb. 24, 2000, Appl. No. 512,281.

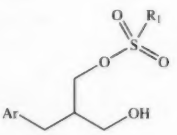
Claims priority, application Japan, Aug. 2, 1996, 8-220344; Sep. 10, 1996, 8-262398

Int. Cl. C07C *311/00*

U.S. Cl. 558—44 **13 Claims**

1. An optical active 2-aralkyl-3-sulfonyloxy-1-propanol having the following general formula (1):

(1)



wherein Ar is an aryl group that may be substituted and R_1 is methyl group, ethyl group, n-propyl group, isopropyl group, benzyl group, p-chlorophenyl group, p-bromophenyl group, p-methoxyphenyl group, o-nitrophenyl group, m-nitrophenyl group, p-nitrophenyl group or 1-naphthyl group.

US 6,410,774 B1
METHOD FOR RECOVERY OF CATALYST COMPONENTS

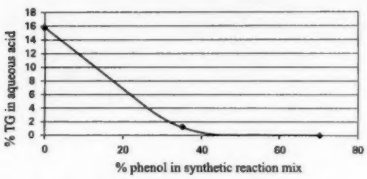
Marsha Mottel Grade; John Yaw Ofori, both of Niskayuna, and Eric James Pressman, East Greenbush, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 30, 2001, Appl. No. 822,129

Int. Cl. C07C *69/96*

U.S. Cl. 558—274 **44 Claims**

Tetraglyme partitioning



1. A method for recovering a substantially water-soluble solvent and at least one metal from an organic reaction mixture comprising at least about 35% by weight aromatic hydroxy compound, which comprises the steps of: (i) contacting a reaction mixture at least once with aqueous acid, (ii) mixing the organic and aqueous phases in the presence of an oxygen source, (iii) separating the organic and aqueous phases wherein said solvent remains substantially in the organic phase; (iv) recovering metal species from the aqueous phase; and (v) recovering said solvent from the organic phase.

US 6,410,775 B1
APL IMMUNOREACTIVE PEPTIDES, CONJUGATES THEREOF AND METHODS OF TREATMENT FOR APL ANTIBODY-MEDIATED PATHOLOGIES

Edward Jess Victoria, San Diego; David Matthew Marquis, Encinitas; David S. Jones, and Lin Yu, both of San Diego, all of Calif., assignors to La Jolla Pharmaceutical Company, San Diego, Calif.

Continuation of application No. 08/760,508, filed on Dec. 5, 1996, now abandoned, which is a continuation-in-part of application No. 08/660,092, filed on Jun. 6, 1996, now Pat. No. 6,207,160, which is a continuation-in-part of application No. 08/482,651, filed on Jun. 7, 1995, now Pat. No. 5,874,409. This application Sep. 24, 1998, Appl. No. 160,513.

Int. Cl. C07C *321//16*

U.S. Cl. 560—15 **5 Claims**

1. Hydrophilic linkers for connecting peptides or other bioactive molecules to valency platform molecules with the formula

$$R^1S(CH_2CH_2O)_nCH_2CH_2O(CH_2)_mCO_2R^2$$

wherein n=0–200, m=0 to 10, R^1=a protecting group, and R^2=aryl.

US 6,410,776 B1
METHOD FOR PRODUCING RESOLS

Willi Roll, Altenberge; Axel Bottcher, Wesel; Walter Napp, Duisburg, and Peter Fricke, Kevelaer, all of Germany, assignors to Bakelite AG, Germany

PCT No. PCT/EP99/10477, § 371 Date Oct. 4, 2000, § 102(e) Date Oct. 4, 2000, PCT Pub. No. WO00/44802, PCT Pub. Date Aug. 3, 2000

PCT Filed Dec. 30, 1999, Appl. No. 647,422

Claims priority, application Germany, Jan. 29, 1999, 199 03 487

Int. Cl. C07C *261/00*

U.S. Cl. 560—25 **10 Claims**

1. Process for the preparation of resols by reacting phenolic compounds with aldehydes with catalysis by metal salts whose cations, can easily be precipitated as low-solubility salts in industrial processes, characterized in that a dispersant is added to the reaction mixture comprising phenolic compound, aldehyde and metal salt before, during or after the condensation reaction, and a complexing agent is admixed after the condensation reaction is complete and after the dispersants has been admixed.

US 6,410,777 B1
SALICYLIC ACID ESTER DERIVATIVE AND ITS PRODUCTION

Hiroaki Kaneko; Wataru Funakoshi, and Katsushi Sasaki, all of Yamaguchi, Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP98/01564, § 371 Date Oct. 4, 1999, § 102(e) Date Oct. 4, 1999, PCT Pub. No. WO98/45246, PCT Pub. Date Oct. 15, 1998

PCT Filed Apr. 3, 1998, Appl. No. 402,359

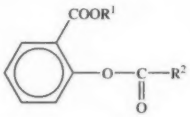
Claims priority, application Japan, Apr. 4, 1997, 9-086525; May 7, 1997, 9-116777; May 8, 1997, 9-118080; Feb. 18, 1998, 10-035967

Int. Cl. C07C *69/88;69/96*

U.S. Cl. 560—68 **69 Claims**

1. A salicylic acid ester derivative having a chlorine content of 10 ppm or below and expressed by the following formula (1)

(1)



in the formula, R^1 is methyl group or ethyl group, R^2 is an alkyl group having a carbon number of from 1 to 30, an alkoxy group having a carbon number of from 1 to 30, an aryl group having a carbon number of from 6 to 30, an aryloxy group having a carbon number of from 6 to 30, an aralkyl group having a carbon number of from 6 to 30 or an aralkyloxy group having a carbon number of from 6 to 30; the group R^2 may have, as a substituent, methoxycarbonyl group, ethoxycarbonyl group, 2-(methoxycarbonyl)phenyloxycarbonyl group, 2-(methoxycarbonyl)phenyloxycarbonyloxy group, 2-(ethoxycarbonyl)phenyloxycarbonyl group, 2-(ethoxycarbonyl)phenyloxycarbonyloxy group or an aryloxycarbonyl group or aralkyloxycarbonyl group having a carbon number of from 6 to 10.

US 6,410,778 B2
METHOD OF PRODUCING ORGANIC DIURETHANES AND/OR POLYURETHANES AND THEIR USE IN THE PRODUCTION OF DI AND/OR POLYISOCYANATES

Gerhard Laqua, Limburgerhof; Ulrich Schoner, Schwarzheide; Andreas Otterbach, Frankenthal, all of Germany, and Hans Volkmar Schwarz, Waterloo, Belgium, assignors to BASF Aktiengesellschaft, Germany

PCT No. PCT/EP96/04710, § 371 Date May 7, 1998, § 102(e) Date May 7, 1998, PCT Pub. No. WO97/17323, PCT Pub. Date May 15, 1997

PCT Filed Oct. 30, 1996, Appl. No. 68,361

Claims priority, application Germany, Nov. 7, 1995, 195 41 384

Int. Cl. C07C *269/00*

U.S. Cl. 560—115 **7 Claims**

1. A process for preparing aliphatic and/or cycloaliphatic organic diurethanes and/or polyurethanes by reacting

a) aliphatic and/or cycloaliphatic organic di- and/or polyamines with

b) urea, alkyl carbamates or mixtures of urea, alkyl carbamates and/or dialkyl carbonates; and

c) alcohol in the presence of a

d) catalyst,

wherein the catalyst used comprises zirconium compounds as the catalyst in an amount of from 0.00001 to 1 mol %, based on the diamines and/or polyamines.

US 6,410,779 B1

Patent Not Issued For This Number

US 6,410,780 B1

C11 OXYMYL AND HYDROXYLAMINO PROSTAGLANDINS USEFUL AS MEDICAMENTS

Mitchell Anthony deLong, West Chester; Jack Snyder Amburgey, Jr., Loveland; John August Wos; Biswanath De, both of Cincinnati, and David Lindsey Soper, Monroe, all of Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

PCT No. PCT/IB99/00478, § 371 Date Sep. 28, 2000, § 102(e) Date Sep. 28, 2000, PCT Pub. No. WO99/50241, PCT Pub. Date Oct. 7, 1999

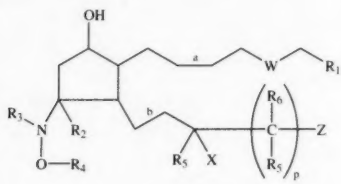
Provisional application No. 60/080,075, filed on Mar. 31, 1998. This PCT application Mar. 22, 1999, Appl. No. 647,381.

This patent is subject to a terminal disclaimer.

Int. Cl. C07C *69/74;* **A61K** *31/215*

U.S. Cl. 560—121 **24 Claims**

1. A compound having the structure:



characterized in that

(a) R_1 is CO_2H, C(O)NHOH, CO_2R_7, CH_2OH, $S(O)_2R_7$, $C(O)NHR_7$, $C(O)NHS(O)_2R_7$, or tetrazole; characterized in that R_7 is alkyl, heteroalkyl, monocyclic carbocyclic aliphatic ring, monocyclic heterocyclic aliphatic ring, monocyclic aromatic ring, or monocyclic heteroaromatic ring;

(b) W is O, NH, S, S(O), $S(O)_2$, or $(CH_2)_m$; characterized in that m is an integer from 0 to about 3;

(c) R_2 is H and R_3 is H or lower alkyl, or R_2 and R_3 together form a covalent bond;

(d) R_4 is H, alkyl, heteroalkyl, monocyclic carbocyclic aliphatic ring, monocyclic heterocyclic aliphatic ring, monocyclic aromatic ring, or monocyclic heteroaromatic ring, provided that when each R_5 and R_6 is H, R_4 is other than methyl;

(e) each R_5 is independently selected from the group consisting of H, CH_3, and C_2H_5;

(f) X is NHR_8 or OR_8, characterized in that each R_8 is independently selected from the group consisting of H, acyl, alkyl, heteroalkyl, monocyclic carbocyclic aliphatic ring, monocyclic heterocyclic aliphatic ring, monocyclic aromatic ring, and monocyclic heteroaromatic ring;

(g) each R_6 is independently selected from the group consisting of H, CH_3, C_2H_5, OR_8, and NHR_8;

(h) Z is H, methyl, monocyclic carbocyclic aliphatic ring, monocyclic heterocyclic aliphatic ring, monocyclic aromatic ring, monocyclic heteroaromatic ring, bicyclic carbocyclic aliphatic ring, bicyclic heterocyclic aliphatic ring, bicyclic aromatic ring, or bicyclic heteroaromatic ring;

(i) a and b are independently selected from the group consisting of single bond, cis double bond, and trans double bond;

(j) p is an integer from 0 to 6; and

any optical isomer, diastereomer, enantiomer of the above structure or a pharmaceutically-acceptable salt, or bio-hydrolyzable amide, ester, or imide thereof.

US 6,410,781 B1

α-AMINOACETIC ACID DERIVATIVES-$\alpha_4\beta_7$ RECEPTOR ANTAGONISTS

Andrei W. Konradi, San Francisco; Michael A. Pleiss, Sunnyvale, and Eugene D. Thorsett, Half Moon Bay, all of Calif., assignors to Elan Pharmaceuticals, Inc., S. San Francisco, Calif.

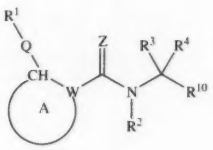
Provisional application No. 60/122,071, filed on Mar. 1, 1999. This application Feb. 28, 2000, Appl. No. 514,773.

Int. Cl. C07C *271/44;* **A61K** *31/27*

U.S. Cl. 560—133 **33 Claims**

1. A compound of Formula I:

(I)



wherein:

A together with —CH— and W forms a cyclic group selected from the group consisting of cycloalkyl, and substituted cycloalkyl;

Q is selected from the group consisting of alkylene, substituted alkylene, —CO—, $—NR^5$ —(where R^5 is hydrogen, alkyl, or acyl), —O—, or $—S(O)_q$ where q is an integer from 0 to 2;

W is —CH—;

Z is —O— or —S—;

R^1 is selected from the group consisting of aryl, substituted aryl, heteroaryl, substituted heteroaryl, heterocyclic, substituted heterocyclic, cycloalkyl, and substituted cycloalkyl;

R^2 is selected from the group consisting of hydrogen, alkyl which is optionally substituted with one to four substituents independently selected from R^a and Cy which is optionally substituted with one to four substituents independently selected from R^b wherein R^a and R^b are as defined below;

R^3 is selected from the group consisting of:

(a) -(alkylene)-Ar—R^6, -(alkenylene)-Ar—R^6, or -(alkynylene)-Ar—R^6 where:

Ar is selected from the group consisting of aryl, heteroaryl, or heterocyclic wherein said aryl, heteroaryl, and heterocyclic rings are optionally substituted with one or two substituents independently selected from R^a wherein R^a is as defined below;

R^6 is selected from the group consisting of —O—Y—NR^7R^8 and —O—Y—R^9 wherein Y is selected from the group consisting of —C(O)— and $—SO_2—$; R^7 and R^8 are independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, heterocyclic, and substituted heterocyclic; or R^7 and R^8 are joined to form a heterocycle or substituted heterocycle; and R^9 is heterocycle or substituted heterocycle;

(b) -(alkyene)-Ar^2—Ar^1,-(alkenylene)-Ar^2—Ar^1 and -(alkynylene)-Ar^2—Ar^1, wherein Ar^1 and Ar^2 are independently aryl or heteroaryl each of which is optionally substituted with one to four substituents independently selected from R^b as defined below; and alkylene, alkenylene and alkynylene are optionally substituted with one to four substituents independently selected from R^a as defined below;

R^4 is selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, aryl, aryl-$C_{1\text{-}10}$alkyl, heteroaryl, and heteroaryl-$C_{1\text{-}10}$ alkyl wherein alkyl, alkenyl and alkynyl are optionally substituted with one to four substituents selected from R^a as defined below; and aryl and heteroaryl are option-

ally substituted with one to four substituents independently selected from R^b as defined below;

R^a is selected from the group consisting of Cy, $—OR^d$, $—NO_2$, halogen, $—S(O)_mR^d$, $—Sr^d$, $—S(O)_2OR^d$, $—S(O)_mNR^dR^e$, $—NR^dR^e$, $—O(CR^fR^g)_nNR^dR^e$, $—C(O)R^d$, CO_2R^d, $—CO_2(CR^fR^g)_nCONR^dR^e$, $—OC(O)R^d$, —CN, $—C(O)NR^dR^e$, $—NR^dC(O)R^e$, $—OC(O)NR^dR^e$, $—NR^dC(O)OR^e$, $—NR^dC(O)NR^dR^e$, $—CR^d(N—OR^e)$, CF_3, and $—OCF_3$; wherein Cy is optionally substituted with one to four substituents independently selected from R^c wherein:

R^c is selected from the group consisting of halogen, amino, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, aryl, aryl-C_{1-4} alkyl, hydroxy, CF_3, and aryloxy;

R^d and R^e are independently selected from hydrogen, alkyl, alkenyl, alkynyl, Cy and Cy-alkyl wherein alkyl, alkenyl, alkynyl and Cy are optionally substituted with one to four substituents independently selected from R^c; or R^d and R^e together with the atoms to which they are attached form a heterocyclic ring of 5 to 7 atoms and containing 0–2 additional heteroatoms independently selected from oxygen, sulfur and nitrogen; and

R^f and R^g are independently selected from hydrogen, alkyl, Cy and Cy-alkyl; or R^f and R^g together with the carbon to which they are attached form a ring of 5 to 7 atoms containing 0–2 heteroatoms independently selected from oxygen, sulfur and nitrogen;

R^b is selected from the group consisting of R^a as defined above, alkyl, alkenyl, alkynyl, aryl-C_{1-10} alkyl, heteroaryl-C_{1-10} alkyl, wherein alkyl, alkenyl, alkynyl, aryl, heteroaryl are optionally substituted with a group independently selected from R^c;

Cy is cycloalkyl, heterocyclyl, aryl, or heteroaryl; and

R^{10} is selected from the group consisting of $—C(O)OR^d$, $—P(O)(OR^d)(OR^e)$, $—P(O)(R^d)(OR^e)$, $—S(O)_mOR^d$, and $—C(O)NR^dR^h$ where:

R^d and R^e are as defined above;

R^h is selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, cyano, aryl, aryl-C_{1-10} alkyl, heteroaryl, heteroaryl-C_{1-10} alkyl, or $—SO_2R^i$ wherein alkyl, alkenyl, and alkynyl are optionally substituted with one to four substitutents independently selected from R^a; and aryl and heteroaryl are each optionally substituted with one to four substituents independently selected from R^b where R^a and R^b are as defined above;

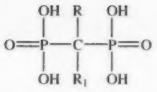
R^i is selected from the group consisting of alkyl, alkenyl, alkynyl, and aryl wherein alkyl, alkenyl, alkynyl and aryl are each optionally substituted with one to four substituents independently selected from R^c;

m is an integer from 1 to 2; and

n is an integer from 1 to 10;

or pharmaceutically acceptable salts, individual isomer, mixtures of isomers, and prodrugs thereof.

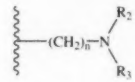
(I)



where $R{=}R_1$ or $R{\neq}R_1$ and R and R_1 are selected from:

H, OH, Cl, linear or branched, substituted or not substituted alkyl groups, a group of formula (X)

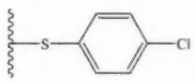
(X)



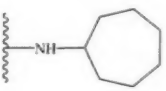
where n is 1 to 6 and $R_2{=}R_3$ or $R_2{\neq}R_3$ and R_2 and R_3 are selected from H and linear or branched, cyclic, substituted or unsubstituted alkyl groups,

a group of formula (II), (III), (IV) or (IX):

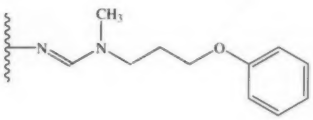
(II)



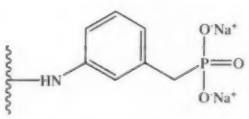
(III)



(IV)



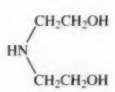
(IX)



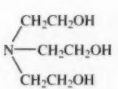
and

an amino-alcohol of formula (XVI) to (XIX):

(XVII)



(XVIII)



US 6,410,782 B1

DIPHOSPHONIC ACID SALTS FOR THE TREATMENT OF OSTEOPOROSIS

Fred VanGulik, Laan Copes van Cattenburch, Netherlands, and Antonio Parente, Sant Just Desvern, Spain, assignors to Geange Ltd., Dublin, Ireland; Eurodrug Ltd., Hong Kong, China, and Lipotec SA, De Llobregat, Spain

PCT No. PCT/EP98/04238, § 371 Date Apr. 3, 2000, § 102(e) Date Apr. 3, 2000, PCT Pub. No. WO99/02539, PCT Pub. Date Jan. 21, 1999

PCT Filed Jul. 8, 1997, Appl. No. 446,617

Claims priority, application Italy, Jul. 9, 1997, MI97A1628

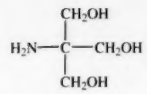
Int. Cl. C07F *9/38*

U.S. Cl. 562—13 **4 Claims**

1. A pharmaceutical composition for the treatment of osteoporosis comprising, together with a carrier or a diluent, a salt of a diphosphonic acid of formula

-continued

(XIX)



provided that

when R≠R_1 and R=OH, R_1=CH_3 the amino-alcohol is not tromethamine (XIX), triethanolamine (XVIII), diethanolamine (XVII) or ethanolamine (XVI);

when R≠R_1 and R=H, R_1=CH_2OH the amino-alcohol is not ethanolamine (XVI); and further provided that when R=OH and R_1=$C_{11}H_{23}$ or $C_{17}H_{35}$ the amino—alcohol is not triethanolamine (XVIII).

US 6,410,783 B1

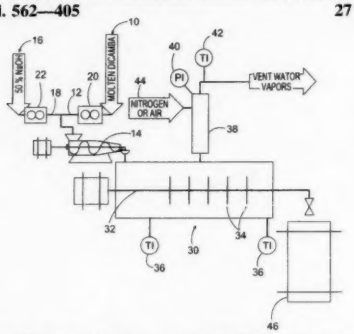
METHOD OF PRODUCING CARBOXYLIC ACID SALTS

Rodger E. Peterson, Beaumont, Tex.; Terrance M. Cannan, Raleigh, N.C., and Rudolph E. Lisa, Grosse Ile, Mich., assignors to BASF Corporation, Mt. Olive, N.J.

Filed Oct. 19, 2000, Appl. No. 692,119

Int. Cl. C07C *63/00;63/33;63/337;63/44;63/04*

U.S. Cl. 562—405 **27 Claims**



1. A method of making a dry, alkali metal or ammonium salt of a carboxylic acid, comprising the steps of:

feeding a molten carboxylic acid consisting essentially of dicamba and an alkali metal-containing or ammonium-containing alkaline compound in solution to a mixer;

reacting the molten dicamba and the alkali metal-containing or ammonium-containing alkaline compound to form an alkali metal or ammonium dicamba salt such that the dicamba is substantially neutralized to form a pasty, sticky material;

advancing the dicamba salt and any remaining dicamba or alkaline compound to a dryer;

removing water from the alkali metal or ammonium dicamba salt in the dryer to produce dry, alkali metal or ammonium dicamba salt particles; and

recovering the dry, alkali metal or ammonium dicamba salt particles.

US 6,410,784 B1

RECOVERY OF METAL COMPONENTS OF A CATALYST IN A PROCESS FOR PRODUCTION OF TRIMELLITIC ACID

Hsi-Yen Hsu, and Ching-Tang Lin, both of Hsinchu, Taiwan, assignors to Chinese Petroleum Corporation, Taiwan

Filed Apr. 16, 2001, Appl. No. 835,670

Int. Cl. C07C *51/16;* **B01J** *20/34;38/62;31/00*

U.S. Cl. 562—414 **6 Claims**

1. A recovering process for recovering cobalt and manganese components from a product stream that resulted from a manufacturing process of oxidizing pseudocumene to trimellitic acid in an acetic acid medium in the presence of a catalyst system containing the cobalt and manganese components, or from a residue stream that resulted from distillation of the aforesaid product stream, comprising the steps of:

adding 2,3-pyridine dicarboxylic acid to the product stream or the residue stream in an effective amount to react with the cobalt and manganese components in the product stream or the residual stream so as to form a precipitate of cobalt and manganese 2,3-pyridine dicarboxylates in the product stream or the residual stream; and

separating the precipitate of cobalt and manganese 2,3-pyridine dicarboxylates from the product stream or the residual stream.

US 6,410,785 B1

METHOD FOR PRODUCING ACROLEIN BY HETEROGENEOUS CATALYTIC GAS-PHASE PARTIAL OXIDATION OF PROPENE

Peter Zehner, Ludwigshafen; Otto Machhammer; Heiko Arnold, both of Mannheim, and Klaus Joachim Müller-Engel, Stutensee, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP00/00304, § 371 Date Jul. 18, 2001, § 102(e) Date Jul. 18, 2001, PCT Pub. No. WO00/43341, PCT Pub. Date Jul. 27, 2000

PCT Filed Jan. 15, 2000, Appl. No. 869,294

Claims priority, application Germany, Jan. 22, 1999, 199 02 562

Int. Cl. C07C *51/25;45/35*

U.S. Cl. 562—532 **9 Claims**

1. A process for the preparation of acrolein by gas-phase partial oxidation of propene with molecular oxygen under heterogeneous catalysis over solid-state catalysts, wherein a reaction gas starting mixture which contains propene and molecular oxygen in a molar C_3H_6:O_2 ratio of >1 is first passed, at elevated temperatures, through a first reaction zone I equipped with a first solid-state catalyst load I and a portion of the propene contained in the reaction gas starting mixture is oxidized to acrolein and then, to complete the partial oxidation of the propene to acrolein, the product gas mixture I emerging from the reaction zone I is passed, at elevated temperatures, through at least one further reaction zone having a solid catalyst load and, in at least one of the one or more further reaction zones, the molar ratio, present in the reaction gas mixture, of molecular oxygen to propene is increased by metering in molecular oxygen and/or a gas containing molecular oxygen, with the proviso that, in the product gas mixture emerging from the last reaction zone, at least 90 mol %, based on the propene fed to the reaction zone I, of the propene are converted with a selectivity of the acrolein formation of ≧80 mol %.

US 6,410,786 B1

PROCESS FOR PRODUCING METHACRYLIC ACID

Hideo Onodera, Himeji; Naomasa Kimura, Okayama, and Eiichi Shiraishi, Himeji, all of Japan, assignors to Nippon Shokubai Co, Ltd, Osaka, Japan

Filed Apr. 24, 2000, Appl. No. 556,697

Claims priority, application Japan, Apr. 27, 1999, 11-119170; May 6, 1999, 11-126034

Int. Cl. C07C *51/21*

U.S. Cl. 562—535 **7 Claims**

1. A process for producing methacrylic acid by vapor phase oxidation of methacrolein with molecular oxygen or a molecular oxygen-containing gas using a catalyst-filled, fixed bed shell-and-tube reactor, which is characterized in that

(1) the catalyst layer in each of the reaction tubes is divided into at least two layers in the axial direction of the tube to provide plural reaction zones and

(2) the catalyst is filled in the plural reaction zones in such a manner that the amount of the catalytically active component

per unit volume of the reaction tube decreases from the gas inlet portion toward the gas outlet portion of the reactor.

US 6,410,787 B2

PROCESS TO PREPARE 2-AMINOINDAN DERIVATIVES

Arthur Glenn Romero, Kalamazoo; Thomas Andrew Runge, Scotts; Bradley D. Hewitt, Kalamazoo; Kjell Anders Ivan Svensson; Chiu-Hong Lin, both of Portage; Kerry Anne Cleek, Kalamazoo, and Susanne R. Haadsma-Svensson, Portage, all of Mich., assignors to Pharmacia & Upjohn Company, Kalamazoo, Mich.

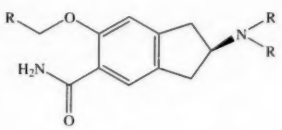
Provisional application No. 60/184,020, filed on Feb. 22, 2000. This application Feb. 14, 2001, Appl. No. 783,649.

Int. Cl. C07C *233/65;231/18;* **A61K** *31/165*

U.S. Cl. 564—165 **12 Claims**

1. A compound of formula I

I



or a pharmaceutically acceptable salt thereof wherein each R is independently C_{1-8} alkyl.

US 6,410,788 B1

PROCESS TO PRODUCE OXAZOLIDINONES

Bruce Allen Pearlman, Kalamazoo, Mich., assignor to Pharmacia & Upjohn Company, Kalamazoo, Mich.

Division of application No. 09/546,357, filed on Apr. 10, 2000, which is a division of application No. 09/170,776, filed on Oct. 13, 1998, now Pat. No. 6,107,519, Provisional application No. 60/064,738, filed on Nov. 7, 1997. This application Aug. 9, 2001, Appl. No. 927,007.

Int. Cl. C07C *251/24*

U.S. Cl. 564—276 **1 Claim**

1. A compound selected from the group consisting of:

(1) an (S)-protected alcohol of the formula (IVA)

$$X_2—CH_2—C^*H(OH)—CH_2—N{=}CH—X_0 \quad \text{(IVA)}$$

where:

(I) X_0 is:

(A)—ϕ,

(B) o-hydroxyphenyl,

(C) o-methoxyphenyl,

(D) p-methoxyphenyl;

(II) X_2 is:

(A) —Cl,

(B) —Br,

(C) p-CH_3—ϕ—SO_2—,

(D) m-NO_2—ϕ—SO_2—.

US 6,410,789 B1

PROCESS FOR PREPARING AROMATIC POLYAMINE MIXTURES

Rainer Becker, Bad Dürkheim; Karsten Eller, Ludwigshafen; Hans-Werner Langensiepen, Bobenheim-Roxheim, and Michael Hesse, Worms, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP98/00981, § 371 Date Nov. 8, 1999, § 102(e) Date Nov. 8, 1999, PCT Pub. No. WO98/37124, PCT Pub. Date Aug. 27, 1998

PCT Filed Feb. 20, 1998, Appl. No. 367,971

Claims priority, application Germany, Feb. 24, 1997, 197 07 255; Jun. 9, 1997, 197 24 237; Jun. 9, 1997, 197 24 213

Int. Cl. C07C *211/00*

U.S. Cl. 564—330 **17 Claims**

1. A process for preparing aromatic polyamine mixtures which contain compounds of the formula (I)

$$H_2N—A—CH_2—B—NH_2 \quad \text{(I)}$$

where A and B are 1,4-phenylene radicals each of which independently of one another can have from 1 to 4 substituents selected from C_{1-20} alkyls and halogens,

by reacting a compound of the formula (IV)

$$H—A—NH—CH_2—HN—B—H \quad \text{(IV)}$$

and/or a compound of the formula (V)

$$H—A—NH—CH_2—B—NH_2 \quad \text{(V)}$$

where A and B are substituted as defined above,

at from 20° C. to 200° C. in the presence of a heterogeneous inorganic catalyst which is selected from the group consisting of

a) one or more oxides of elements of group 3 to group 10 of the Periodic Table of Elements, except vanadium, which can be acid-activated by sulfuric acid, phosphoric acid or hydrochloric acid and can thus contain sulfate, phosphate or chloride,

b) a catalyst comprising a clay which is doped with at least one oxide of elements of groups 2 to 13 or the lanthanides of the Periodic Table of the Elements, carried out by impregnation or by means of ion exchange, and can be acid-activated or

c) a catalyst comprising one or more silicates which can be acid-activated and have an acidity below pK_a=1.5 of more than 0.05 mmol/g of catalyst.

US 6,410,790 B1

3-AMIN3-ARYLPROPAN-1-OL COMPOUNDS, THEIR PREPARATION AND USE

Bernd Sundermann, Aachen; Hagen-Heinrich Hennies, Simmerath; Babette-Yvonne Koegel, Langerwehe-Hamich, and Helmut Buschmann, Aachen, all of Germany, assignors to Gruenenthal GmbH, Aachen, Germany

Filed Apr. 7, 2000, Appl. No. 545,371

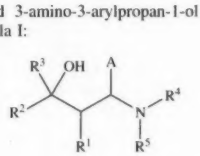
Claims priority, application Germany, Apr. 7, 1999, 199 15 601

Int. Cl. C07C *211/00;* **A61K** *31/445*

U.S. Cl. 564—336 **39 Claims**

1. A substituted 3-amino-3-arylpropan-1-ol compound corresponding to formula I:

I

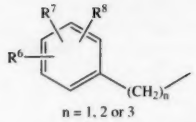


wherein

R^1 and R^2 each independently denote C_{1-6} alkyl, or R^1 and R^2 together denote a $(CH_2)_{2-6}$ ring which may be substituted by phenyl,

R^3 denotes C_{3-6} alkyl, C_{3-6} cycloalkyl, aryl which may contain heteroatoms in the ring system and which may carry substituents R^6 to R^8 on the aryl ring, or a substituted C_{1-3} alkylphenyl group corresponding to formula XII:

XII



n = 1, 2 or 3

R^4 and R^5 each independently denote C_{1-6} alkyl, C_{3-6} cycloalkyl, phenyl, benzyl, or phenethyl, or R^4 and R^5 together form a $(CH_2)_{3-6}$ ring or $CH_2CH_2OCH_2CH_2$ ring,

R^6 to R^8 each independently denote H, F, Cl, Br, CHF_2, CF_3, OH, OCF_3, OR^{14}, $NR^{15}R^{16}$, SR^{14}, phenyl, SO_2CH_3, SO_2CF_3, C_{1-6} alkyl, CN, $COOR^{14}$, or $CONR^{15}R^{16}$, or R^6 and R^7 together form a OCH_2O, OCH_2CH_2O, CH═CHO, $CH═C(CH_3)O$ or $(CH_2)_4$ ring, wherein

R^{14} denote C_{1-6} alkyl, phenyl, benzylt or phenethyl, and

R^{15} and R^{16} each independently denote H, C_{1-6} alkyl, phenyl, benzyl or phenethyl, and

A denotes an aryl radical which may contain heteroatoms in the ring system and which may be be substituted,

or a diastereomer or enantiomer thereof,

or a salt thereof with a physiologically acceptable acid, with the proviso that 1-benzyl-2-(dimethylaminophenylmethyl) cyclohexanol, diastereomers thereof, enantiomers thereof and reaction products thereof with methyliodide are excluded.

US 6,410,791 B1

NITRIC ESTERS AND NITRATE SALTS OF SPECIFIC DRUGS

Piero Del Soldato, Milan, Italy, assignor to Nicox S.A., Paris, France

PCT No. PCT/EP99/05171, § 371 Date Jan. 22, 2001, § 102(e) Date Jan. 22, 2001, PCT Pub. No. WO00/06531, PCT Pub. Date Feb. 10, 2000

PCT Filed Jul. 20, 1999, Appl. No. 743,808

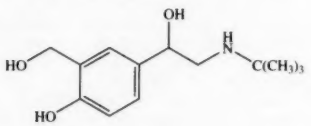
Claims priority, application Italy, Jul. 28, 1998, MI98A1743

Int. Cl. A61K *31/21;* **C07C** *203/04;215/00*

U.S. Cl. 564—361 **9 Claims**

1. A nitrate salt of a compound selected from the group consisting of:

salbutamol having the formula (I)



US 6,410,792 B1

AMIDE DERIVATIVES AND METHODS FOR USING THE SAME AS SELECTIVE NEUROPEPTIDE Y RECEPTOR ANTAGONISTS

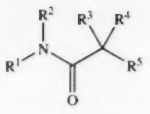
Richard D. Connell, Trumbull; Timothy G. Lease, Guilford; Gaetan H. Ladouceur, Branford, and Martin H. Osterhout, New Haven, all of Conn., assignors to Bayer Corporation, West Haven, Conn.

Division of application No. 09/023,498, filed on Feb. 13, 1998, now Pat. No. 6,048,900, Provisional application No. 60/135,105, filed on Feb. 14, 1997. This application Apr. 20, 1999, Appl. No. 294,961.

Int. Cl. C07C *211/00;* **A61K** *31/335*

U.S. Cl. 564—463 **8 Claims**

1. A compound having the formula:



or pharmaceutically acceptable salts thereof wherein R_1–R_5 are each individually selected from the group of substituents including hydrogen, halogen, hydroxyl, thiol lower alkyl, substituted lower alkyl, alkenyl, alkynyl, alkylalkenyl, alkyl alkynyl, alkoxy, alkylthio, acyl, aryloxy, amino, amido, carboxyl, aryl, substituted aryl, heterocycle, heteroaryl, substituted heterocycle, heteroalkyl, cycloalkyl, substituted cycloalkyl, alkylcycloalkyl, alkylcycloheteroalkyl, nitro, and cyano and wherein the compound is not a compound selected from the group consisting of N-(2,6-Dibromo-4-ethyl-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-pi- peridin-1-yl]-acetamide, N-(2-Amino-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, N-(2,4-Difluoro-benzyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, 5-Chloro-2-{2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetylamino}-benzoic acid methyl ester, 5-Amino-2-{2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetylamino}-benzamide, N-(2-Amino-4-benzenesulfonyl-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)piperidin-1-yl]-acetamide, N-(4-Diethylamino-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, 2-[4-(2-Oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-N-(4-phenylamino-phenyl)-acetamide, N-(3-Dimethylamino-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, N-(2-Amino-4-propylsulfanyl-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, N-(7-Hydroxy-naphthalen-1-yl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, N-(4-Chloro-3-nitro-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, N-(4-Bromo-3-chloro-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, N-(7-Butoxy-naphthalen-2-yl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, N-(1H-Indazol-6-yl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, N-(4-Hydroxy-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, N-(4-Ethoxy-naphthalen-1-yl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, N-(4Ethoxy-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, N-(2-Chloro-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, 2-[4-(2-Oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1yl]-N-(4-phenylazo-phenyl)-acetamide 4-{2-[4-(2-Oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetylamino}-benzamide, N-(4-Acetylamino-phenyl)-2-[4-(2-oxo-2.3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, 2-[4-(2-Oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-N-(4-phenoxy-phenyl)-acetamide, N-(4-Dimethylamino-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl]-piperidin-1-yl-acetamide, N-(4-Acetyl-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, N-(4-Nitro-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, 2-[4-(2-Oxo-2,3dihydro-benzoidazol-1-yl)-piperidin- 1-yl]-N-(4-trifluoromethyl-phenyl)-acetamide, N-(3-Chloro-4-nitro-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoidazol-1-yl)-piperidin-1-yl]-acetamide, N-(4-Chloro-phenyl)-2-[4-(2-oxo-2,3dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetamide, 2-[4-(2-Oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-N-p-tolyl-acetamide, 4-{2-[4-(2-Oxo-2,3-dihydro-benzoimidazol-1-yl)-piperidin-1-yl]-acetylamino}-benzoic acid methy, ester, N-(4-Methoxy-phenyl)-2-[4-(2-oxo-2,3-dihydro-benzoidazol-1-yl)-piperidin-1-yl]-acetamide, and N-(4-Cyclohexyl-phenyl)-2-morpholin-4-yl-acetamide.

US 6,410,793 B1

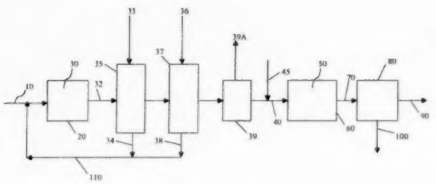
PRODUCTION OF FORMALDEHYDE FROM CARBON OXIDES AND H_2S

Israel E. Wachs, Bridgewater, N.J., assignor to Lehigh University, Bethlehem, Pa.

Provisional application No. 60/047,758, filed on May 27, 1997, Provisional application No. 60/060,156, filed on Sep. 26, 1997. This application May 12, 1998, Appl. No. 76,005.

Int. Cl. C07C *319/02;319/12;47/02*

U.S. Cl. 568—21 **11 Claims**



1. A process for producing formaldehyde from a gas containing carbon oxide and hydrogen sulfide (H_2S) comprising contacting the gas stream with a first catalyst comprising a supported metal oxide of a metal selected from the group consisting of vanadium (V), niobium (Nb), molybdenum (Mo), chromium (Cr), rhenium (Re), tungsten (W), manganese (Mn), titanium (Ti), zirconium (Zr) and tantalum (Ta) and mixtures thereof, wherein said support is selected from titania, zirconia, niobia, ceria, tin oxide and mixtures thereof with the proviso that the support and the supported metal are not the same, to convert said carbon oxide and hydrogen sulfide (H_2S) to an intermediate compound selected from the group consisting of CH_3SH, CH_3SCH_3, CH_3SSCH_3 and mixtures thereof, and then contacting said intermediate compound with a second catalyst selected from a supported metal oxide of a metal selected from the group consisting of vanadium (V), niobium (Nb), molybdenum (Mo), chromium (Cr), rhenium (Re), tungsten (W), manganese (Mn), titanium (Ti), zirconium (Zr), tantalum (Ta) and mixtures thereof, and a bulk metal oxide catalyst selected from the group consisting of molybdates (Mo), chromates (Cr), vanadates (V), rhenates (Re), titanates (Ti), niobates (Nb), tungstates (W), and mixtures thereof, under oxidizing conditions for a time sufficient to convert at least a portion of said intermediate compound to formaldehyde and sulfur dioxide, and recovering said formaldehyde.

US 6,410,794 B1

PROCESS FOR PREPARATION OF PHARMACEUTICALLY DESIRED CHIRAL TETRALONE FROM TETRALONES

Herman A. Zinnen, Evanston, and Mark J. Gattuso, Palatine, both of Ill., assignors to UOP LLC, Des Plaines, Ill.

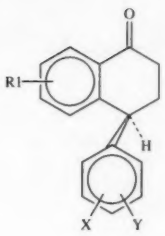
Continuation-in-part of application No. 09/255,300, filed on Feb. 22, 1999, now Pat. No. 6,162,949, which is a continuation-in-part of application No. 08/357,910, filed on Dec. 16, 1994, now Pat. No. 5,889,186. This application Nov. 3, 2000, Appl. No. 705,306.

Int. Cl. C07C *63/00*

U.S. Cl. 568—309 **23 Claims**

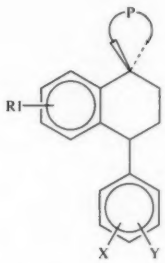
1. In a process for preparation of compounds of formula III

III



by selectively converting a carbonyl protected compound of formula V to III

V



where R1 is selected from the group consisting of hydrogen, fluoro, chloro, bromo, trifluoromethyl, and alkoxy having from 1 to 3 carbon atoms, where X and Y are independently selected from the group consisting of hydrogen, fluoro, chloro, bromo, trifluoromethyl, cyano, and alkoxy having from 1 to 3 carbon atoms, with at least one of X or Y being other than hydrogen, and •~P~• is a carbonyl protecting group, the improvement comprising the selective preparation of III of at least 95% enantiomeric purity by:

a) resolving racemic V, in a resolution stage, by simulated moving bed chromatography using a chiral adsorbent to afford a first enantiomer of V in at least 95% enantiomeric purity and a second enantiomer of V;

b) selectively converting the first enantiomer of V to compound III; and

c) racemizing the second enantiomer of V to racemic V and recycling the racemic V to the resolution stage.

US 6,410,795 B1

PROCESS FOR BASE-PROMOTED CONDENSATION REACTIONS AND BASE REAGENT THEREFOR

Michael H. Fisch, Wayne, N.J.; Edward Krainer, Lynbrook, N.Y., and Radu Bacaloglu, Hamburg, N.J., assignors to Crompton Corporation, Middlebury, Conn.

Filed Jan. 26, 2001, Appl. No. 769,429

Int. Cl. C07C *45/72*

U.S. Cl. 568—314 **20 Claims**

1. A method for the preparation of 1,3-diketones comprising the steps of:

(A) providing a mixture of an alkali metal hydroxide, an aromatic hydrocarbon, and an alcohol having a boiling point of a least 100° C. at atmospheric pressure;

(B) heating the mixture and removing non-alkoxide by-product formed by reaction of the alkali metal hydroxide and the alcohol, whereby a solution of an alkali metal alkoxide in the aromatic hydrocarbon is formed;

(C) mixing a carboxylic acid ester with the solution of the alkali metal alkoxide;

(D) adding a ketone and heating at a temperature in the range of 40–150° C. until the formation of 1,3-diketone is substantially complete; and

(E) recovering 1,3-diketone from the reaction mixture.

US 6,410,796 B2

PROCESS FOR THE PREPARATION OF POLY(FLUOROALKYL)ACETOPHENONES

Wulf Kühnle, and Thomas Höpfner, both of Köln, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 8, 2000, Appl. No. 732,684

Claims priority, application Germany, Dec. 22, 1999, 199 62 011; Jan. 27, 2000, 100 03 321

Int. Cl. C07C *45/00*

U.S. Cl. 568—323 **12 Claims**

1. A process for the preparation of acetophenones that are di- or polysubstituted by fluoroalkyl groups on the aromatic ring comprising

(a) preparing a diazonium salt mixture from the corresponding fluoroalkylaniline in the presence of a hydrohalic acid and at least one strong acid that is not a hydrohalic acid,

(b) reacting the diazonium salt mixture with acetaldoxime at 5 to 50° C. in the presence of halide ions, at least one strong acid that is not a hydrohalic acid, and at least one copper and/or palladium compound and in the absence of buffer salts and reducing agents, and

(c) heating the mixture from step (b) to a temperature in the range 70 to 160° C.

US 6,410,797 B1

PROCESS FOR THE PRODUCTION OF KETOISOPHORONE DERIVATIVES AND EQUIPMENT THEREFOR

Tomohide Ina, Himeji; Hiroyuki Miura, Takasago, and Ikuo Takahashi, Kobe, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP99/07245, § 371 Date Aug. 28, 2000, § 102(e) Date Aug. 28, 2000, PCT Pub. No. WO00/40536, PCT Pub. Date Jul. 13, 2000

PCT Filed Dec. 24, 1999, Appl. No. 623,081

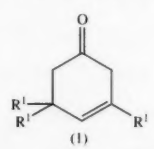
Claims priority, application Japan, Dec. 28, 1998, 10-372783; Dec. 21, 1999, 11-362478

This patent is subject to a terminal disclaimer.

Int. Cl. C07C *45/61*

U.S. Cl. 568—344 **10 Claims**

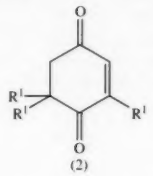
1. A process for producing a ketoisophorone derivative, which comprises, in the presence of an oxidizing catalyst comprising a complex salt of an element of the Group 7 of the Periodic Table of Elements and an N,N'-disalicylidenediamne, oxidizing a β-isophorone derivative represented by the following formula (1):



(1)

wherein the groups R^1 are the same or different, each representing an alkyl group, a cycloalkyl group, an aryl group, or a heterocyclic group

in a solvent containing 0 to 4,000 ppm by weight of an acid component to form a ketoisophorone derivative represented by the following formula (2):



(2)

wherein the groups R^1 have the same meaning as defined above.

US 6,410,798 B2

PROCESS FOR THE PREPARATION OF 2,3,5-TRIMETHY1-P-BENZOQUINONE

Ralf Maassen, Hanau; Steffen Krill, Speyer, and Klaus Huthmacher, Gelnhausen, all of Germany, assignors to Degussa-Huls Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 8, 2001, Appl. No. 801,092

Claims priority, application Germany, Mar. 9, 2000, 100 11 405

Int. Cl. C07C *45/00;49/105*

U.S. Cl. 568—358 **10 Claims**

1. A process for the preparation of 2,3,5-trimethyl-p-benzoquinone by oxidation of 2,3,5- or 2,3,6-trimethylphenol using oxygen or a gas containing oxygen in a two-phase liquid reaction medium using a catalyst containing at least copper (II) halide at elevated temperature, wherein the reaction is carried out in a mixture composed of water and a neocarboxylic acid having 8 to 11 carbon atoms and at temperatures from 50° C. to 100° C.

US 6,410,799 B1

HYDROFORMYLATION PROCESS EMPLOYING A CATALYST BASED ON COBALT AND/OR RHODIUM IN A NON-AQUEOUS IONIC SOLVENT

Frédéric Favre, Saint Fons; Dominique Commereuc, Meudon; Hélène Olivier-Bourbigou, Rueil-Malmaison, and Lucien Saussine, Croissy sur Seine, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison Cedex, France

Filed Aug. 23, 2001, Appl. No. 935,330

Claims priority, application France, Aug. 23, 2000, 00/10971

Int. Cl. C07C *45/50*

U.S. Cl. 568—420 **18 Claims**

1. A process for liquid phase hydroformylation of olefinically unsaturated compounds in which the reaction is carried out in the presence of at least one non-aqueous ionic solvent comprising at least one salt with general formula $Q^+ A^-$, where Q^+ represents a quaternary ammonium and/or phosphonium cation, and A^- represents an anion, and at least one cobalt and/or rhodium complex coordinated by at least one ligand selected from the group formed by nitrogen-containing or phosphorus-containing ligands also carrying an ionic function $(Q')^+(A')^-$ where at least the cation $(Q')^+$ or anion $(A')^-$ has the same chemical nature as the cation Q^+ or anion A^- of the non-aqueous ionic solvent.

US 6,410,800 B1

PROCESS FOR PREPARING ACROLEIN

Tae Sun Chang; Deug Hee Cho, and Dong Koo Lee, all of Daejeon, Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Rep. of Korea

Filed Sep. 29, 2000, Appl. No. 671,999

Claims priority, application Rep. of Korea, Sep. 30, 1999, 99-41981

Int. Cl. C07C *45/35*

U.S. Cl. 568—479 **2 Claims**

1. A process for preparing acrolein in the presence of a solid catalyst having a core-shell structure represented in formula 1 by the oxidation of propylene,

$$[Bi_nA_aO_x][(100\text{-}z)\%E_eFe_fNi_gMo_mO_y\text{+}z\%SiO_2] \quad (1)$$

wherein A is at least one element selected from the group consisting of boron, phosphorus, and molybdenum;

E is at least one element having the atomic valence of 2;

when m is 1, n is 0.001–3, a is 0–3, e is 0–3, f is 0.01–5, g is 0.1–5, and z is 0–90; and

x and y are numbers such that the valence requirements of the other elements for Oxygen in the core and shell catalytic phase, respectively, are satisfied.

US 6,410,801 B1

CONTINUOUS PROCESS FOR THE PRODUCTION OF POLYETHER POLYOLS

Werner Hinz, and Edward Michael Dexheimer, both of Grosse Ile, Mich., assignors to BASF Corporation, Mt. Olive, N.J.

Filed Nov. 18, 1999, Appl. No. 442,882

Int. Cl. C07C *43/20*

U.S. Cl. 568—606 **12 Claims**

1. A continuous process of forming polyether polyols comprising-the steps of:

a) continuously forming an initial reaction mixture of at least one alkylene oxide and a self catalyzing initiator having at least one reactive hydrogen which is reactive to said alkylene oxide in the absence of a catalyst;

b) continuously flowing said initial reaction mixture through a first spiral shaped reaction tube having an internal diameter and a spiral diameter that promote a pseudo-turbulent flow of said initial reaction mixture through said first spiral shaped reaction tube to form a reaction product;

c) flowing said reaction product into a second spiral shaped reaction tube operably connected to said first spiral shaped reaction tube and adding a catalyst and an alkylene oxide to said reaction product, said second spiral shaped reaction tube having an internal diameter and a spiral diameter that promote a pseudo-turbulent flow of said reaction product, said catalyst and said alkylene oxide in said second spiral shaped reaction tube; and

d) continuously flowing a heat exchange medium around said first and said second spiral shaped reaction tubes, said heat exchange medium establishing and maintaining a reaction temperature between 130° C. and 250° C. in said first and said second spiral shaped reaction tubes.

US 6,410,802 B1

METHODS FOR SYNTHESIZING ETHER COMPOUNDS AND INTERMEDIATES THEREFOR

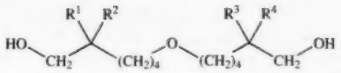
Jean-Louis Henri Dasseux, Brighton, Mich., and Carmen Daniela Oniciu, Gainesville, Fla., assignors to Esperion Therapeutics, Inc., Ann Arbor, Mich.

Provisional application No. 60/127,321, filed on Apr. 1, 1999. This application Mar. 31, 2000, Appl. No. 540,740.

Int. Cl. C07D *41/16;41/01*

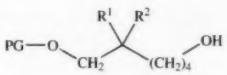
U.S. Cl. 568—680 **5 Claims**

1. A method for synthesizing a compound of a formula II:



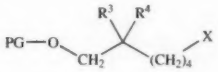
II

comprising: (a) contacting in the presence of a base a compound of a formula XXIV:



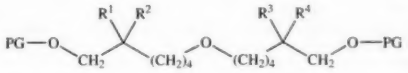
XXIV

with a compound of a formula XXVIII



XXVIII

to provide a compound of a formula XXIX



XXIX

and; (b) deprotecting the compound of the formula XXIX to provide the compound of the formula II, wherein:

R^1, R^2, R^3, and R^4 are independently selected from the group consisting of $(C_1–C_6)$alkyl, $(C_2–C_6)$alkenyl, $(C_2–C_6)$alkynyl, phenyl, and benzyl; or R^1, R^2, and the carbon to which they are attached are taken together to form a $(C_3–C_7)$cycloalkyl group; or R^3, R^4, and the carbon to which they are attached are taken together to form a $(C_3–C_7)$cycloalkyl group; with the proviso that none of R^1, R^2, R^3, or R^4 is $—(CH_2)_{0\text{-}4}C{\equiv}CH$; X is a halide or sulfonate; and PG is a hydroxy protecting group.

US 6,410,803 B1

PROCESS FOR THE PREPARATION OF PARA-FLUOROPHENOL

Michel Adda, Kfar-Saba, Israel, assignor to Bromine Compounds Limited, Beer Sheva, Israel

PCT No. PCT/IL98/00248, § 371 Date Jan. 5, 2000, § 102(e) Date Jan. 5, 2000, PCT Pub. No. WO99/02473, PCT Pub. Date Jan. 21, 1999

PCT Filed May 28, 1998, Appl. No. 462,281

Claims priority, application Israel, Jul. 7, 1997, 121253

This patent is subject to a terminal disclaimer.

Int. Cl. C07C *39/24*

U.S. Cl. 568—775 **16 Claims**

1. A method for the preparation of p-fluorophenol by the alkaline hydrolysis of p-bromofluorobenzene in the presence of a copper-containing catalyst at an elevated temperature under pressure, the alkaline agent being a strong base, wherein said p-bromofluorobenzene, copper-containing catalyst and strong base are contacted with water where at least the base is gradually added to the reaction zone at an essentially uniform flow rate such that the addition of the base lasts at least the time required to complete the reaction in a batch operation, and less than 12 hours, and the molar ratio of the base is between 1.8 to 3 with respect to said p-bromofluorobenzene.

US 6,410,804 B1

PRODUCTION OF PHENOL USING REACTIVE DISTILLATION

Doron Levin, Bala Cynwyd, and Jose G. Santiesteban, West Chester, both of Pa., assignors to Exxon Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 21, 1999, Appl. No. 468,465

Int. Cl. C07C *37/08*

U.S. Cl. 568—798 **13 Claims**

1. A process for producing phenol and acetone from cumene hydroperoxide, which comprises:

i) introducing a cumene hydroperoxide feed into a reactive distillation column comprising at its upper portion a distillation column and at its lower portion a catalyst bed, at a point above or at an upper portion of said catalyst bed;

ii) mixing a diluting portion of acetone with said cumene hydroperoxide to provide a diluted cumene hydroperoxide;

iii) directing said diluted cumene hydroperoxide through said catalyst bed under conditions sufficient to effect the exothermic decomposition of said cumene hydroperoxide to a product comprising a heavy fraction comprising phenol and a vaporized light fraction comprising acetone;

iv) withdrawing said heavy fraction as bottoms from said column;

v) flowing said vaporized light fraction upwards through the catalyst bed and at least a portion of the reactive distillation column;

vi) condensing said light fraction to provide at least a portion of said diluting portion of acetone for subsequent mixing with said cumene hydroperoxide feed;

vii) optionally withdrawing a portion of said light fraction as overhead from said column; and

viii) repeating steps i) through vii).

US 6,410,805 B2

METHOD AND COMPOSITION FOR HYDROXYLATION OF AROMATIC SUBSTRATES

Terence Michael Barnhart, Pattersonville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of application No. 09/259,652, filed on Feb. 26, 1999, now Pat. No. 6,265,622. This application Jan. 16, 2001, Appl. No. 759,503.

Int. Cl. C07C *37/00*

U.S. Cl. 568—802 **13 Claims**

1. A composition for hydroxylating an aromatic substrate having at least one active aromatic hydrogen, consisting of oxygen, hydrogen, and a catalyst formed in solution from a vanadium, niobium, or tantalum precursor or mixture thereof, at least one anionic ligand precursor, and at least one neutral, electron-donating ligand precursor.

US 6,410,806 B2

REDUCTION-TREATED COPPER-BASED CATALYST AND PROCESS FOR PRODUCING α-PHENYLETHYL ALCOHOL USING THE SAME

Noriaki Oku, Ichihara, and Masaru Ishino, Sodegaura, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 18, 2001, Appl. No. 761,830

Claims priority, application Japan, Jan. 19, 2000, 2000-009841

Int. Cl. C07C *27/00*

U.S. Cl. 568—814 **4 Claims**

1. A process for producing α-phenylethyl alcohol, which comprises reducing a copper-based catalyst comprising 10 to 90% by weight of CuO with hydrogen in the presence of a liquid medium to obtain a reduced copper-base catalyst, and subsequently contacting said reduced catalyst with acetophenone under hydrogenation conditions to produce α-phenylethyl alcohol.

US 6,410,807 B1

SYNTHESIS OF CYCLOHEXENE DIMETHANOL COMPOUNDS

Hu Yang, San Ramon; Ta Yen Ching, Novato, and Gangfeng Cai, Danville, all of Calif., assignors to Chevron Phillips Chemical Company LP, Houston, Tex.

Filed May 10, 2000, Appl. No. 567,593

Int. Cl. C07C *31/20*

U.S. Cl. 568—831 **34 Claims**

1. A method for producing a cyclohexene dimethanol or a cyclohexane dimethanol compound, comprising:

(a) adding a base solution to a formaldehyde solution to form a formaldehyde/base solution;

(b) adding an aldehyde selected from the group consisting of tetrahydrobenzaldehydes and cyclohexane carboxyaldehyde to the formaldehyde/base solution to form a reaction solution;

(c) maintaining the temperature of the reaction solution between about 10° C. and about 30° C. for at least about 1 hr; and

(d) recovering cyclohexene dimethanol or cyclohexane dimethanol product from said reaction solution.

US 6,410,808 B1

METHOD FOR PRODUCING A FLUOROALCOHOL

Yutaka Furukawa; Nobuyuki Kasahara; Kazuya Oharu, and Shin Tatematsu, all of Yokohama, Japan, assignors to Asahi Glass Company, Limited, Tokyo, Japan

Filed Apr. 24, 2001, Appl. No. 840,072

Claims priority, application Japan, Apr. 26, 2000, 2000-126462

Int. Cl. C07C *31/34*

U.S. Cl. 568—842 **9 Claims**

1. A method for producing a fluoroalcohol of the following formula 1a, consisting essentially of reacting a compound of the following formula 1 with water in a liquid phase at a temperature of 150° C. or higher under a gauge pressure of 0.4 MPa or higher:

Formula 1

$$R[CF_2(CH_2)_nX]_p$$

Formula 1a

$$R[CF_2(CH_2)_nOH]_p$$

wherein n is an integer of from 1 to 5, X is a chlorine atom, a bromine atom or an iodine atom, p is an integer of at least 1, and R is a p-valent organic group, provided that when p is 1, R may be a hydrogen atom or a halogen atom.

US 6,410,809 B1

CYCLOHEXANEDIMETHANOL COMPOUND AND PROCESS OF PRODUCING PRODUCTIVE INTERMEDIATES THEREFOR

Masato Kaneda, and Yoshihiro Honda, both of Oita, Japan, assignors to Showa Denko K.K., Tokyo, Japan

PCT No. PCT/JP00/04694, § 371 Date Sep. 26, 2000, § 102(e) Date Sep. 26, 2000, PCT Pub. No. WO01/05736, PCT Pub. Date Jan. 25, 2001

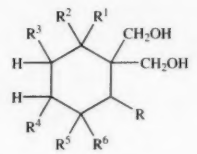
PCT Filed Jul. 13, 2000, Appl. No. 647,063

Claims priority, application Japan, Jul. 14, 1999, 11-199977

Int. Cl. C07C *31/27*

U.S. Cl. 568—883 **14 Claims**

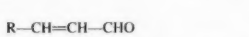
1. A process of producing a 1,1-cyclohexanedimethanol compound having a substituent group at least at the 2-position thereof of formula (1):



(1)

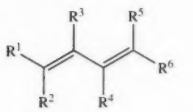
(wherein R and R^1 to R^6have the same meanings below), comprising the steps of:

reacting a β-substituted-α,β-unsaturated aldehyde of formula (2):



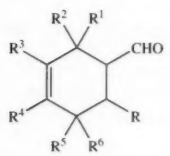
(2)

(wherein R represents an alkyl group having 1 to 4 carbon atoms or a phenyl group) and a chain conjugated diene compound of formula (3):



(3)

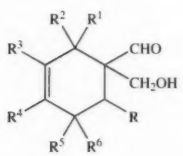
(wherein R^1 to R^6 independently represent a hydrogen atom or an alkyl group having 1 to 4 carbon atoms) in the presence of an anhydrous tin (IV) halide catalyst to obtain a 3-cyclohexene-1-carbaldehyde having a substituent group at least at the 6-position thereof of formula (4):



(4)

(wherein R and R^1 to R^6have the same meanings as defined above),

reacting the compound of formula (4) with formaldehyde in the presence of an alkali catalyst to obtain a 1-hydroxymethyl-3-cyclohexene-1-carbaldehyde compound having a substituent group at least at the 6-position thereof of formula (5):



(5)

(wherein R and R^1 to R^6 have the same meanings as defined above), and

subjecting the compound of formula (5) to hydrogenation reaction.

14. 1-Hydroxymethyl-6-methyl-3-cyclohexene-1-carbaldehyde.

US 6,410,810 B1

HANDLING METHOD OF (FLUOROARYL) BORANE COMPOUND AND PREPARING METHOD OF HYDROCARBON SOLUTION

Hitoshi Mitsui, Kitakatsuragi-gun; Tsunemasa Ueno, Ikeda; Ikuyo Ikeno, Osaka, and Naoko Hirano, Nishinomiya, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

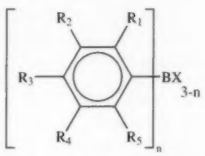
Continuation-in-part of application No. 09/145,335, filed on Sep. 1, 1998, now abandoned. This application Feb. 24, 2000, Appl. No. 512,289.

Claims priority, application Japan, Sep. 18, 1997, 9-253830

Int. Cl. C07C *7/20;* **C07F** *5/02*

U.S. Cl. 585—2 **2 Claims**

1. A method of preparing a hydrocarbon solution of a mixture of bis- and tris(fluoroaryl)borane compounds expressed as:



(1)

where each of R_1, R_2, R_3, R_4, and R_5 independently represents one of a hydrogen atom, a fluorine atom, a hydrocarbon group, and an alkoxy group provided that at least one of R_1–R_5 represents a fluorine atom, X represents one of a fluorine atom, a chlorine atom, a bromine atom, and an iodine atom, and wherein n represents 2 for the bis(fluoroaryl)borane compounds and 3 for the tris(fluoroaryl)borane compounds, wherein a hydrocarbon solution of said (fluoroaryl)borane compounds having a concentration of said tris(fluoroaryl)borane compounds in a range between 1 wt % and 10 wt % is prepared by combining said (fluoroaryl)borane compounds with a hydrocarbon solvent A to form a slurry, containing a mixture of (fluoroaryl)borane compounds having both n=2 and n=3, and then dissolving said slurry into a hydrocarbon solvent B in a virtually air-tight vessel.

US 6,410,811 B2

SELECTIVE HYDROGENATION PROCESS COMPRISING PARTIAL SEPARATION OF HYDROGEN BY A MEMBRANE UPSTREAM OF A REACTIVE COLUMN

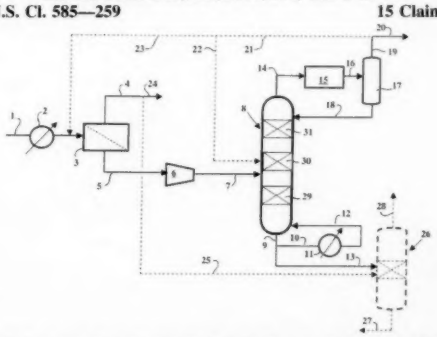
Michel Chau; Michel Derrien, both of Rueil-Malmaison, and Alain Methivier, Orleans, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison Cedex, France

Filed Mar. 8, 2001, Appl. No. 800,508

Claims priority, application France, Mar. 8, 2000, 00 0366

Int. Cl. C07C *5/03;5/08;7/163;7/14;* **C10G** *45/00*

U.S. Cl. 585—259 **15 Claims**

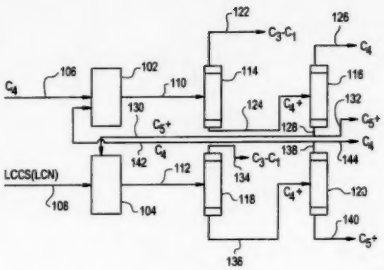


1. A process for selective hydrogenation of a hydrocarbon feed containing hydrogen and C_2+ hydrocarbons comprising diolefins,

polyolefins and acetylenics with the provision that said hydrogen in the feed is present in a stoichiometric excess of that required for saturating the monoolefins, diolefins, polyolefins and acetylenics, said process comprising

a) at least one step for separating a fraction of the hydrogen contained in the feed by means of a membrane under conditions to produce a retentate having a mol ratio of hydrogen to the sum of moles of diolefins, polyolefins and acetylenics of 1.8:1 to 1.2:1, and

(b) a step for selective hydrogenation of the effluent from step a) in a reactive column.



US 6,410,812 B1

PROCESS FOR RECOVERING BORON TRIFLUORIDE FROM A CATALYST COMPLEX

Kenneth D. Hope; Ting C. Ho, both of Kingwood, Tex.; David L. Archer, Decatur, Ala.; Russell J. Bak, The Woodlands, Tex.; J. Barry Collins, New Caney, Tex., and Doug W. Burns, Kingwood, Tex., assignors to Chevron Phillips Chemical Company LP, Houston, Tex.

Filed Mar. 1, 2000, Appl. No. 516,578

Int. Cl. C07C *2/08;7/00*

U.S. Cl. 585—525 **19 Claims**

1. A process scheme for the oligomerization of an alpha-olefin in the presence of boron trifluoride catalyst which comprises:

(a) contacting in an oligomerization zone an alpha olefin feed with a catalytic mixture comprising an effective catalytic amount of a catalyst complex consisting of boron trifluoride and a protic promoter under conditions and for a time sufficient to oligomerize the alpha olefins in the feed whereby a liquid organic mixture is formed comprising a polyalphaolefin product and the catalytic mixture;

(b) recovering the liquid organic mixture from the oligomerization zone;

(c) reducing the pressure of the liquid organic mixture recovered in step (b) sufficiently to separately recover (i) a gas comprising at least a portion of the boron trifluoride present in the catalytic mixture and at least a portion of inert gas present in the liquid organic mixture, and (ii) a liquid product stream comprising the polyalphaolefin product and residual catalyst complex;

(d) mixing the gaseous boron trifluoride recovered from step (c) with fresh protic promoter to form fresh catalyst and promoter mixture, wherein the catalyst and promoter mixture is substantially free of the inert gas;

(e) introducing the fresh catalyst and promoter mixture from step (d) into the oligomerization zone of step (a); and

(f) recovering the polyalphaolefin product from the liquid product stream of step (c).

US 6,410,813 B1

PRODUCTION OF OLEFINS

Jean-Pierre Dath, Beloeil; Walter Vermeiren, Houthalen, both of Belgium, and Koen Herrebout, Houston, Tex., assignors to Fina Research, S.A., Feluy, Belgium

Filed Jun. 19, 2000, Appl. No. 596,406

Claims priority, application European Pat. Off., Jun. 17, 1999, 99111725

Int. Cl. C07C *4/02;* **C10G** *11/00*

U.S. Cl. 585—653 **17 Claims**

1. A process for cracking an olefin-containing hydrocarbon feedstock which is selective towards light olefins in the effluent, the process comprising passing a hydrocarbon feedstock containing one or more olefins through a reactor containing a crystalline silicate selected from the group consisting of an MFI-type crystalline silicate having a silicon/aluminium atomic ratio of at least 180 and an MEL-type crystalline silicate having a silicon/aluminium atomic ratio of from 150 to 800 which has been subjected to a steaming step, at an inlet temperature of from 500 to 600° C., at an olefin partial pressure of from 0.1 to 2 bars and the feedstock being passed over the catalyst at an LHSV of from 5 to 30 h^{-1} to produce an effluent with an olefin content of lower molecular weight than that of the feedstock, wherein the olefin-containing hydrocarbon feedstock includes a C_5-containing overhead cut from a first fractionator which has been fed with a C_5+ hydrocarbon feedstock, the bottom fraction from the first fractionator being a C_6+ cut and the C_5+ hydrocarbon feedstock comprises a bottom fraction from a second fractionator which has been fed with a feedstock having at least C_4+ hydrocarbons, and the overhead from the second fractionator comprises a C_4 containing cut, optionally further containing C_3 hydrocarbons.

US 6,410,814 B2

PROCESS FOR SYNTHESIS OF LOWER ISOPARAFFINS FROM SYNTHESIS GAS

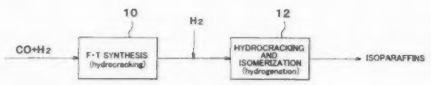
Kaoru Fujimoto, and Noritatsu Tsubaki, both of Tokyo-to, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, and Genesis Research Institute, Inc., Nagoya, both of Japan

Filed Apr. 3, 2001, Appl. No. 824,144

Claims priority, application Japan, Apr. 4, 2000, 2000-102047

Int. Cl. C07C *1/04;5/22;5/13;* **C10G** *65/02;64/02*

U.S. Cl. 585—733 **18 Claims**



1. A process for synthesis of lower isoparaffins from synthesis gas that is a mixture of hydrogen and carbon monoxide, comprising the steps of:

synthesizing straight chain hydrocarbons in a first stage by contacting the synthesis gas with a Fischer-Tropsch synthesis catalyst that is mixed with a solid acid catalyst for mainly hydrocracking long chain hydrocarbons; and

synthesizing isoparaffins in a second stage by contacting the straight chain hydrocarbons synthesized in the first stage, with a mixture of a hydrogenation catalyst for hydrogenating olefins and a solid acid catalyst for hydrocracking and isomerizing the straight chain hydrocarbons.

US 6,410,815 B1
AGGLOMERATED ZEOLITE ADSORBENTS, PROCESS FOR THEIR PREPARATION, AND THEIR USE FOR ADSORBING PARAXYLENE FROM AROMATIC C_8 FRACTIONS

Dominique Plee, Puteaux, and Alain Methivier, Rueil-Malmaison, both of France, assignors to Elf Atochem S.A., Puteaux, France

PCT No. PCT/FR98/01818, § 371 Date May 10, 2000, § 102(e) Date May 10, 2000, PCT Pub. No. WO99/10096, PCT Pub. Date Mar. 4, 1999

PCT Filed Aug. 18, 1998, Appl. No. 485,907

Claims priority, application France, Aug. 21, 1997, 97 10535

Int. Cl. C07C *7/00;7/12;* **B01J** *29/06;29/08;21/16*

U.S. Cl. 585—828 **16 Claims**

1. Agglomerated zeolite adsorbents comprising at least 70% of faujasite with an Si/Al atomic ratio such that $1 \leqq Si/Al \leqq 1.15$, in which exchangeable sites of the zeolite adsorbents are at least 70% occupied by barium ions, and optionally up to 30% occupied by potassium, and in which the zeolite adsorbents are agglomerated with a binder, wherein the adsorbents have a loss on ignition, measured at 900° C., of between 4.0 and 7.7%.

US 6,410,816 B2
PROCESSING OIL AND METHOD FOR PRODUCING THE SAME

Masami Takasaki, and Meishi Tanaka, both of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Division of application No. 09/292,310, filed on Apr. 15, 1999, now abandoned. This application Feb. 14, 2001, Appl. No. 782,315.

Claims priority, application Japan, Apr. 17, 1998, 10-107194

This patent is subject to a terminal disclaimer.

Int. Cl. C07C *7/00;7/10*

U.S. Cl. 585—833 **4 Claims**

1. A method for producing a processing oil having a content of polycyclic aromatic hydrocarbon of less than 3 wt. %, comprising:

extracting an oil mixture with a polar solvent in an extraction tower, said oil mixture comprising from 3–60 vol % of a lubricating base oil and from 40–97 vol % of an extract obtained by the extraction of mineral oil with a polar solvent.

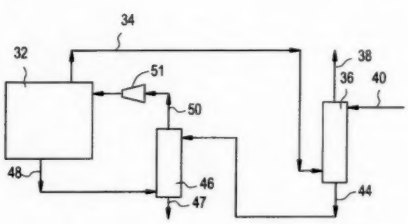
US 6,410,817 B1
ETHYLENE RECOVERY SYSTEM

Philip M. Colling, Corpus Christi, Tex., and Raul A. Hauser Luna, Coatzacoalcos, Mexico, assignors to Celanese International Corporation, Dallas, Tex.

Filed Jun. 29, 1999, Appl. No. 342,938

Int. Cl. C07C *7/11;7/148;7/00*

U.S. Cl. 585—866 **8 Claims**



1. A method for recovery of ethylene from a first, inert gas purge stream containing ethylene and at least one of nitrogen and argon from a reactor loop in a vapor-phase process including a recovery loop, for production of vinyl acetate, the ethylene recovery method comprising:

contacting the first, inert gas purge stream with acetic acid in an absorption vessel to selectively absorb ethylene in the acetic acid;

discharging a second, liquid stream containing acetic acid and ethylene from one portion of the absorption vessel;

discharging out of the recovery loop a third stream containing at least one of nitrogen and argon from another portion of the absorption vessel, wherein the third stream contains less ethylene than the first inert gas stream,

separating the ethylene from the acetic acid in the second stream by contacting the second stream with a fourth, recycle gas stream containing ethylene in a scrubber column; and

recovering ethylene from the scrubber column.

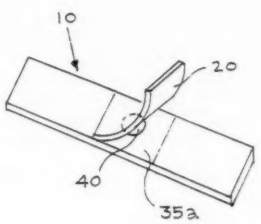
US 6,410,818 B1
DEVICE AND METHOD FOR PROMOTING HEALING OF TOPICAL STRESS CRACKS

Michael F. Oyaski, 207 E. Highland Ave., Ebensburg, Pa. 15931

Filed Dec. 12, 2000, Appl. No. 736,595

Int. Cl. A61F *13/00;13/02;* **A61M** *35/00*

U.S. Cl. 602—54 **14 Claims**



1. A device for promoting healing of a topical stress crack in a predetermined skin portion of a human body, said device comprising:

a) a flexible adhesive element engageable with [such] said skin portion of said human body for drawing and maintaining said stress crack together for a predetermined amount of time;

b) a screen member disposed intermediate with said stress crack and said flexible adhesive element for maintaining closure of said stress crack;

c) at least one reinforcement member engageable with said flexible adhesive element for preventing material deformation of said flexible adhesive element; and

d) a medical adhesive engageable with said screen member for sealing said stress crack together.

10. A method for promoting healing of a stress crack, said method comprising the steps of:

a) positioning a flexible adhesive element with a screen member and a fluid encapsulated unit of medical adhesive attached an aperture formed in said flexible adhesive element over said stress crack;

b) closing said stress crack by securing said flexible adhesive element to skin adjacent said stress crack;

c) applying a predetermined amount of medical adhesive by releasing a said encapsulated unit of medical adhesive through said aperture;

d) allowing said medical adhesive to dry;

e) removing said flexible adhesive element, wherein said screen member and said medical adhesive remain attached to a closed stress crack for a predetermined amount of time, whereby aid stress crack will be healed.

US 6,410,819 B1
METHOD OF PRODUCING AN ABSORBENT STRUCTURE HAVING IMPROVED STRENGTH PROPERTIES

Kent Vartiainen, Lerum, Sweden, assignor to SCA Hygiene Products AB, Goteborg, Sweden

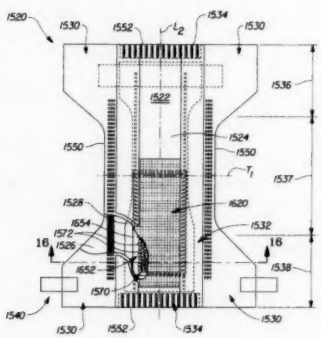
PCT No. PCT/SE97/01890, § 371 Date May 11, 1999, § 102(e) Date May 11, 1999, PCT Pub. No. WO98/20821, PCT Pub. Date May 22, 1998
PCT Filed Nov. 12, 1997, Appl. No. 297,884
Claims priority, application Sweden, Nov. 12, 1996, 9604123
Int. Cl. A61F *13/15*
U.S. Cl. 604—367 **18 Claims**

1. A method of producing an absorbent structure that includes hydrophilic fibres and particles of superabsorbent material, comprising forming an air-laid structure of fibres and superabsorbent particles, moistening at least part of said air-laid structure to a moisture content in the moistened region of at least 15%, calculated on the total weight of the structure within the moistened region, and thereafter drying the structure to a moisture content of at most 12%, the structure containing 3–35% superabsorbent particles, calculated on the total weight of the structure before moistening.

US 6,410,820 B1
METHOD OF MAKING A SLITTED OR PARTICULATE ABSORBENT MATERIAL AND STRUCTURES FORMED THEREBY

Ronald Ray McFall; Gary Dean Lavon, both of West Chester; John Richard Noel, Cincinnati; John Lee Hammons, Hamilton, and Donald Carroll Roe, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of application No. 08/970,508, filed on Nov. 14, 1997, now Pat. No. 5,957,906. This application Feb. 20, 1998, Appl. No. 27,039.
Int. Cl. A61F *13/15*
U.S. Cl. 604—369 **10 Claims**



1. A composite structure of discrete elements of absorbent material for use in a disposable absorbent article, said composite structure comprising:

at least one carrier material; and

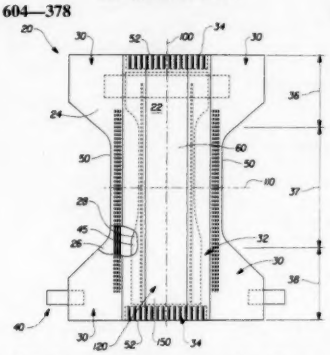
a plurality of discrete elements of absorbent material arranged in an orderly array on said carrier material, wherein said discrete elements are adjoined to each other without any intervening material between said discrete elements of absorbent material and wherein at least some of said discrete elements of absorbent material are joined to said carrier material

wherein said discrete pieces of absorbent material comprise absorbent foam material.

US 6,410,821 B1
DIRECTIONALLY PREFERENTIAL WASTE PASSAGE MEMBER FOR USE WITH DISPOSABLE ABSORBENT ARTICLE

Donald C. Roe, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of application No. 09/106,423, filed on Jun. 29, 1998, now Pat. No. 6,160,200. This application Sep. 25, 2000, Appl. No. 669,079.
Int. Cl. A61F *13/15*
U.S. Cl. 604—378 **6 Claims**



1. An article for preventing bodily exudates from contacting a wearer's skin, the article comprising:

a directionally preferential waste passage member having a body facing surface and an opposed garment facing surface,

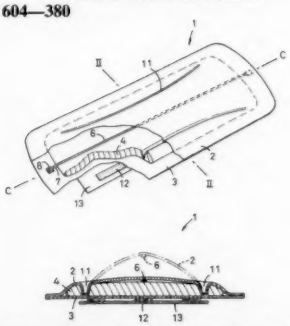
at least a portion of the body facing surface of the directionally preferential waste passage member including an enzyme degradable material which degrades when contacted by enzymes found in bodily exudates so at to permit the bodily exudates to pass through the directionally preferential waste passage member in a first direction generally away from the wearer's skin, and

at least a portion of the garment facing surface of the directionally preferential waste passage member including a barrier material which resists penetration by the bodily exudates in second direction generally opposite to the first direction.

US 6,410,822 B1
SANITARY NAPKIN HAVING ELASTIC MEMBER THAT LIFTS UPPER PORTION THEREOF

Satoshi Mizutani, Kagawa-ken, Japan, assignor to Uni-Charm Corporation, Japan

Filed Sep. 9, 1999, Appl. No. 396,676
Claims priority, application Japan, Sep. 11, 1998, 10-257977
Int. Cl. A61F *13/15;13/20*
U.S. Cl. 604—380 **6 Claims**



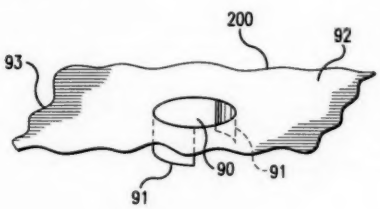
1. A sanitary napkin for absorption and containment of menstrual discharge having a longitudinal center line, said sanitary napkin comprising:

a liquid-pervious topsheet;
a liquid-impervious backsheet;
a liquid-absorbent core disposed between said liquid-pervious topsheet and said liquid-impervious backsheet; and
at least one elastic member being provided between said liquid-pervious topsheet and said liquid-impervious backsheet, said at least one elastic member extending adjacent to said longitudinal center line under tension and having longitudinally opposite ends which are bonded to one of said liquid-pervious topsheet and said liquid-impervious backsheet so that said at least one elastic member can be stretched and contracted between said ends,
a pair of compressed grooves formed in the vicinity of transversely opposite side edges of said sanitary napkin by compressing said liquid-absorbent core and said liquid-pervious topsheet toward said liquid-impervious backsheet, said pair of compressed grooves extending longitudinally of said sanitary napkin and integrating said liquid-pervious topsheet, said liquid-impervious backsheet, and said liquid-absorbent core so that said liquid-pervious topsheet, said liquid-impervious backsheet, and said liquid-absorbent core are not easily separable from one another in said compressed grooves, portions of said sanitary napkin lying in said compressed grooves having a density which is higher than a density adjacent said compressed grooves,
a portion of said sanitary napkin which overlies said at least one elastic member in a thickness direction of the sanitary napkin being formed separably from a portion of said liquid-absorbent core which underlies said at least one elastic member in said thickness direction of the sanitary napkin so that said portion of said sanitary napkin which overlies said at least one elastic member and which is defined between said compressed grooves moves upward and closely contacts a wearer's pudendum as said sanitary napkin is longitudinally curved.

US 6,410,823 B1
APERTURED FILM COVERS WITH LOCALIZED WETTABILITY AND METHOD FOR MAKING THE SAME

Michael Allen Daley, Alpharetta; Mark Bruce Majors, Cumming; Ali Yahiaoui, Roswell; Arthur Edward Garavaglia, Alpharetta; Michael David Powers, Canton; David Wayne Primm, Cumming; Tamara Lee Mace, Doraville; Nancy Donaldson Kollin, Roswell; Gregory Alan Zelazoski, Kennesaw; Jon Edward Tinsley, Roswell, and Jaime Braverman, Atlanta, all of Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Jun. 30, 1998, Appl. No. 108,096
Int. Cl. A61F *13/15*
U.S. Cl. 604—383 **14 Claims**



1. An absorbent material comprising:
an absorbent core;
a backing material which is substantially liquid impervious; and
a cover material comprising a multi-layer polymeric film comprising at least a top layer and a bottom layer and having a top planar surface and a bottom planar surface and forming a plurality of apertures, at least a portion of said plurality of apertures having an aperture region having a higher wettability than a portion of said top planar surface, and a surfactant disposed in at least one layer of said multi-layer polymeric film other than said top layer whereby said higher wettability of said aperture region is maintained after contact by a fluid.

US 6,410,824 B1
ANIMAL MODEL FOR PSORIASIS FOR THE PREVENTION AND TREATMENT OF PSORIASIS IN HUMANS

Rolf Ehrhardt, San Francisco; Kenneth Hong, El Cerrito, and Cary Queen, Los Altos, all of Calif., assignors to Protein Design Labs, Inc., Fremont, Calif.

Provisional application No. 60/111,642, filed on Dec. 9, 1998. This application Dec. 8, 1999, Appl. No. 457,912.
Int. Cl. A01K *67/00;49/00;* **A01N** *63/00;* **C07K** *1/00*
U.S. Cl. 800—9 **13 Claims**

1. A method for inducing a psoriasis-like syndrome in a mouse, the method comprising:
(a) transferring a purified $CD4^{+}CD45Rb^{hi}$ positive T cell population from a donor mouse to an immunocompromised host mouse, wherein said T cell population is tolerant of the host major histocompatibility antigens but is immunoreactive with one or more of the host minor histocompatibility antigens;
(b) administering interleukin-12 and at least one endotoxin to the immunocompromised host mouse of step (a);
wherein the immunocompromised host mouse of step (b) develops a disease comprising one or more characteristics of human psoriasis wherein said characteristics are selected from the group consisting of acanthosis; mononuclear cell infiltration; thickening of epidermis; high vascular density; presence of rete pegs; hyperplasia of epidermis and keratinocytes; microabscesses; thinning of the granular cell layer; pustule formation; scaling; erythema; and destruction of granular cell layers.

US 6,410,825 B1
A-MYB NULL MUTANT TRANSGENIC MICE

Antonio Toscani, deceased, late of Philadelphia, Pa.; by Donato Toscani, heir; by Amelia Toscani, heir, both of Teramo, Italy; Kimi Hatton, Fairfax, Va., and E. Premkumar Reddy, Villanova, Pa., assignors to Temple University-Of The Commonwealth System of Higher Education, Philadelphia, Pa.

PCT No. PCT/US98/06896, § 371 Date Mar. 22, 2000, § 102(e) Date Mar. 22, 2000, PCT Pub. No. WO98/46726, PCT Pub. Date Oct. 22, 1998
Provisional application No. 60/043,353, filed on Apr. 15, 1997. This PCT application Apr. 7, 1998, Appl. No. 402,929.
Int. Cl. A01K *67/00;* **C12N** *15/85;15/09*
U.S. Cl. 800—18 **8 Claims**

1. A transgenic mouse having a genome comprising a homozygous, functionally disrupted A-myb gene, wherein the mouse is an infertile male.

US 6,410,826 B1
REDUCTION OF LIGNIN BIOSYNTHESIS IN TRANSGENIC PLANTS

Martin F. Yanofsky, San Diego; Sarah Liljegren, La Jolla, and Cristina Ferrandiz, San Diego, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Provisional application No. 60/090,649, filed on Jun. 25, 1998. This application Jun. 25, 1999, Appl. No. 339,998.
Int. Cl. C12N *15/82;15/90;5/04;* **A01H** *5/00;7/00*
U.S. Cl. 800—278 **23 Claims**

1. A method of reducing lignification in a vascular plant, the method comprising introducing an exogenous nucleic acid mol-

ecule encoding an AGL8-like gene product at least 50% identical to SEQ ID NO:2 into said vascular plant, whereby lignification is reduced due to ectopic expression of said nucleic acid molecule.

US 6,410,827 B1

GERANYLGERNAYL PYROPHOSPHATE SYNTHASES

Rebecca E. Cahoon; Jennie Bih-Jien Shen, both of Wilmington, and Mark E. Williams, Newark, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Provisional application No. 60/110,592, filed on Dec. 2, 1998. This application Dec. 1, 1999, Appl. No. 452,238.

Int. Cl. A01H *3/00;* **C07H** *21/04;* **C07K** *14/415;* **C12N** *5/14;9/00*

U.S. Cl. 800—278 **14 Claims**

1. An isolated polynucleotide comprising:

(a) a nucleotide sequence encoding a polypeptide having geranylgeranyl pyrophosphate synthase activity, wherein the amino acid sequence of the polypeptide and the amino acid sequence of SEQ ID NO:18 have at least 85% sequence identity, or

(b) the complement of the nucleotide sequence, wherein the complement and the nucleotide sequence contain the same number of nucleotides and are 100% complementary.

US 6,410,828 B1

REGULATORY SEQUENCES USEFUL FOR GENE EXPRESSION IN PLANT EMBRYO TISSUE

Katherine Armstrong, Zionsville; Aaron T. Woosley, Fishers; Dayakar R. Pareddy, Carmel; Beth C. Rubin-Wilson, Indianapolis; Timothy D. Hey, Zionsville; Kelley A. Smith, Lebanon, all of Ind., and Otto Folkerts, Guilford, Conn., assignors to Dow AgroSciences LLC, Indianapolis, Ind.

Provisional application No. 60/109,167, filed on Nov. 20, 1998. This application Nov. 19, 1999, Appl. No. 443,732.

Int. Cl. A01H *1/00;5/10;* **C07H** *21/04;* **C12N** *5/14;15/82*

U.S. Cl. 800—287 **5 Claims**

4. A method of producing seed comprising:

a) introducing into a plant cell a vector comprising an embryo specific maize metallothionein promoter, wherein the promoter comprises a sequence extending from about base pair 50 to base pair 1649 of SEQ ID NO:5, operably linked to a heterologous nucleic acid sequence;

b) regenerating a plant from said cell; and

c) sexually transmitting said embryo specific maize metallothionein promoter operably linked to said heterologous nucleic acid sequence to progeny.

US 6,410,829 B1

HYBRID MAIZE PLANT AND SEED 33K81

Gary Edward Henke, Miami, Mo., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Feb. 11, 1999, Appl. No. 248,659

Int. Cl. A01H *4/00;5/00;* **C12N** *15/29*

U.S. Cl. 800—320.1 **31 Claims**

1. Hybrid maize seed designated 33K81, representative seed of said hybrid 33K81 having been deposited under ATCC accession number PTA-3891.

US 6,410,830 B1

INBRED CORN LINE FR3383

Mark Allen Mikel, Champaign, Ill., assignor to Illinois Foundation Seeds, Inc., Champaign, Ill.

Filed Apr. 13, 2000, Appl. No. 549,032

Int. Cl. A01H *1/00;5/00;5/10;* **C12N** *5/04*

U.S. Cl. 800—320.1 **13 Claims**

1. An inbred corn seed designated FR3383, a sample of said seed having been deposited under ATCC Accession No. PTA-4197.

US 6,410,831 B1

SUNFLOWER SEEDS AND OIL HAVING A HIGH STEARIC ACID CONTENT

Jorge Osorio, Seville; Jose Maria Fernandez, Cordoba; Manuel Mancha, and Rafael Garcés, both of Seville, all of Spain, assignors to Consejo Superior de Investigaciones Cientificas, Seville, Spain

PCT No. PCT/EP95/00369, § 371 Date Jul. 30, 1997, § 102(e) Date Jul. 30, 1997, PCT Pub. No. WO95/20313, PCT Pub. Date Aug. 3, 1995

PCT Filed Jan. 31, 1995, Appl. No. 682,690

Claims priority, application Spain, Jan. 31, 1994, 9400177; Jan. 31, 1994, 9400178; Jun. 24, 1994, 9401383; Jun. 24, 1994, 9401384

Int. Cl. A01H *1/00;5/00*

U.S. Cl. 800—322 **19 Claims**

1. Sunflower seed, comprising a sunflower oil having an increased stearic acid content of more than 12%, obtained by treating parent sunflower seeds with a mutagenic agent during a period of time and in a concentration sufficient to induce one or more mutations in the genetic trait involved in stearic acid biosynthesis resulting in an increased production of stearic acid, germinating the treated seeds and culturing progeny plants therefrom, collecting and analyzing progeny seeds, selecting seeds that have acquired the desirable genetic trait and repeating the cycle of germination, culturing and collection of seeds.

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